

Mission Support Plan

February 2007



Letter from the Deputy Administrator

To be inserted upon completion

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Appendix A - History of the MSP

Appendix B - Definitions

Executive Summary

The Mission Support Plan (MSP) represents NASA's first integrated plan to describe how the mission support organizations support the Agency missions and enable mission success through managing institutional risk to mission. The MSP defines the goals, objectives, and risks to achieving this outcome in a cohesive and integrated manner across five cross-cutting mission support areas, or Focus Areas. These Focus Areas have been selected by Agency leadership as those areas requiring special near-term emphasis to advance the nation's goals through a robust space exploration program. These critical areas are workforce, infrastructure, finance, information systems, and management systems.

The MSP is a high level strategic document that links the Mission Support Offices (MSOs) with the NASA Strategic Plan and it describes how it fits within NASA's governance process. The MSP also establishes integration points across MSO's, Mission Directorates, and the Centers.

1.0 Mission Support Plan: Introduction

The President's announcement of the Vision for Space Exploration marked the beginning of a new era for NASA: exploring new worlds and settling the space frontier. The tasks are daunting, the challenges are unprecedented, and success will demand dramatic changes in the way NASA does business.

Conducting a robust exploration program will require that NASA, manage and fully leverage the capacities and capabilities of all Agency programs, projects, assets, and resources to meet current and future mission needs, even as those needs change over time. Without the contributions and support of NASA's mission support organizations and staff throughout the Agency, success will not be possible. Clearly, mission support is on the critical path to mission success.

Risk is inherent in NASA's Mission. Robotic and human space exploration, scientific study, and aeronautics research are highly complex, technically challenging endeavors, and each embodies a high level of known risk. Institutional management decisions also can introduce risk to missions and lead to institutional failures, and these risks are often hidden. With an eye toward identifying and mitigating such risks, NASA must create the framework to manage institutional risk and ensure that NASA leaders factor institutional risk assessments into their decisions. The Agency's success depends on NASA's ability to fully integrate and balance all aspects of the Agency's portfolio across programs, projects, and mission support organizations.

1.1 Mission Support Plan: Purpose and Contents

The NASA Strategic Plan establishes the Agency's Mission and long-term Strategic Goals¹ for achieving the President's Vision for Space Exploration. This Mission Support Plan (MSP) is the critical first step in formally integrating the Agency's mission support activities with NASA's programs and projects to support and enable mission success.

Achieving the President's Vision requires a tightly integrated relationship between and among NASA's technical programs and mission support organizations. The MSP establishes seven Mission Support Goals (MSGs) that will support achievement of NASA's Strategic Goals and Sub-goals. As such, it serves as the bridging document between these Agency-level Goals and the enabling activities and operations of NASA's mission support organizations. Once fully implemented and operational, the MSP will help ensure that the Agency's institutional portfolio supports NASA's Mission in manageable and measurable ways.

Mission support organizations exist to enable and enhance mission success. This Plan outlines how to more effectively achieve that goal by better managing the institutional

¹ NASA's Strategic Goals include Strategic Sub-goals.

risks to mission. The MSP defines and integrates specific goals, objectives, and risks to achieving the goals across five integrated mission support areas: workforce, infrastructure, finance, information systems, and management systems. The MSP also describes the High-Impact objectives that NASA will emphasize over the next year. Over time, NASA will also put in place structures and processes to ensure: 1) that risks are identified and understood by all parties, both institutional and programmatic; 2) that the most critical and cross-cutting institutional risks are elevated to appropriate levels; and 3) that consideration and evaluation of these risks informs Agency-level decisions on strategy, implementation approaches, and budgets.

The MSP defines the roles and responsibilities of NASA's mission support functions and organizations in executing the NASA Strategic Plan and achieving NASA's Mission. Section 6 includes a set of Mission Support Focus Area Documents for each of the five integrated mission support areas. Each Focus Area Document identifies a Focus Area Lead and includes mission support sub-goals, objectives, and performance metrics to ensure linkage of all institutional activities to the NASA Strategic Plan. The Focus Area Leads are responsible for integration and oversight of their respective Focus Area Documents and for reporting periodically on the performance progress and achievements in each Focus Area to the MSP Lead.

With the goals, sub-goals, and objectives of the MSP as a guide, mission support organizations at NASA Headquarters, Centers and Component Facilities can execute activities to enhance performance of the mission by managing institutional risk to mission. Therefore, the mission support organizations will incorporate actions to be taken, to align the MSP, and relevant performance measures.

With publication of the MSP, NASA will issue new Agency policies and procedures to institutionalize MSP planning as a long-term, repeatable process that aligns mission support activities with NASA's mission and supports informed decision-making. These new policies and procedures will support the roles of the MSP as both a guidance document to ensure alignment of mission support activities to the Agency Strategic Goals and Sub-goals and as a working document to help NASA establish investment priorities as an integral part of the annual planning, budgeting, and execution process.

1.2 Mission Support Organizations

Mission support organizations are key institutional structures that play a critical role in ensuring NASA's success in achieving the Agency's Strategic Goals. Just as NASA establishes and maintains the technical capabilities and resources necessary to execute programs and projects in exploration, science, and aeronautics research, the Agency also maintains the institutional capabilities, competencies, and resources needed to support these programs/projects and comply with external policies and regulations. Currently, nearly thirty NASA organizations provide mission support functions to the Agency.

1.2.1 NASA Headquarters

At NASA Headquarters, many mission support organizations are responsible for setting Agency policies and establishing procedures to implement institutional activities necessary to achieve NASA's Strategic Goals. These organizations include Mission Support Offices (MSOs), functional offices within the MSOs, and staff offices reporting to the Office of the Administrator. Mission support organizations maintain insight into program activities to ensure that NASA programs are conducted in accordance with all statutory, regulatory, and fiduciary responsibilities. They also play a critical role in looking at the Agency's long-term program requirements and setting mission support strategies to address them.

The NASA Headquarters organizations that provide mission support covered by the MSP include:

- a. Office of Safety and Mission Assurance²
- b. Office of the Chief Engineer¹
- c. Office of Program Analysis and Evaluation
- d. Office of the Chief Financial Officer
- e. Office of the Chief Information Officer
- f. Office of the General Counsel
- g. Office of the Integrated Enterprise Management Program
- h. Office of the Chief Health and Medical Officer¹
- i. Office of External Affairs
- j. Innovative Partnerships Program Office
- k. Office of Program and Institutional Integration
- l. Office of Institutions and Management
 - a. NASA Shared Services Center
 - b. Office of Diversity and Equal Opportunity
 - c. Office of Human Capital Management
 - d. Office of Infrastructure and Administration
 - e. Office of Procurement
 - f. Office of Security and Program Protection
 - g. Office of Small Business Programs
- m. Office of the Chief of Strategic Communications
 - a. Office of Communications Planning
 - b. Office of Education
 - c. Office of External Relations
 - d. Office of Legislative and Governmental Affairs
 - e. Office of Public Affairs

² The Office of Safety and Mission Assurance, the Office of the Chief Health and Medical Officer, and the Office of the Chief Engineer have programmatic as well as institutional responsibilities. The scope of this plan only covers their institutional activities.

1.2.2 NASA Centers

NASA's Centers have the primary responsibility for identifying and meeting the institutional needs of the Agency's programs and projects. While NASA Centers and Headquarters MSOs both provide enabling mission support, it is at the Centers where execution occurs through policy implementation, delivery of services, introduction of best practices, and establishment of business standards. Centers and Directorates, also receive benefit from MSO corporate strategy development, integration and assessment. In this way, Center mission support activities are linked directly to the success of all NASA missions.

To achieve optimum efficiency and reduce all possible risk to mission, each Center is sized and staffed to meet its unique needs and to ensure that the skills and abilities of every employee are used fully. Each Center also will pursue ways to conserve resources and improve processes and procedures in ways that serve the Center's and the Agency's needs while contributing to achieving NASA's Mission. Each Center will undertake initiatives to integrate program/project and mission support activities to demonstrate the attributes of strong, healthy, productive Centers identified by NASA's Strategic Management Council:

- Clear, stable, and enduring roles and responsibilities;
- Clear program/project management leadership roles;
- Major in-house, durable spaceflight responsibility;
- Skilled, flexible, blended workforce with sufficient depth and breadth to meet NASA's challenges;
- Technically competent and value-Centered leadership;
- Capable and effectively utilized infrastructure; and
- Strong stakeholder support.

1.2.3 Joint Planning

Headquarters and Center mission support organizations are jointly responsible for enabling mission as well as identifying, managing institutional risk to missions, and mitigating current and future institutional risks to mission. It is NASA's policy to sustain the Agency's long-term viability by deploying processes, techniques, and innovations that meet today's requirements without compromising the ability to meet future needs.

Since the overall goal of mission support activities is to enhance mission performance by managing institutional risk, NASA resources will be focused on achieving this outcome. Agency decision-making will be optimized by integrating accurate, timely, and relevant institutional information with program and project information in the early stages of program and project planning. This will be addressed as part of the PPBE Process and will be reflected in the annual Strategic Planning Guidance issued to NASA HQ Offices

and Centers. Each of the governance councils (OMC, PMC, SMC) will work together to ensure the effectiveness of this integration.

2.0 Mission Support Goals and High-Impact Objectives

NASA's seven Mission Support Goals (MSGs) reflect the Agency's efforts to enhance mission success.

2.1 Mission Support Goals (MSGs)

MSG-1: Determine mission needs and corresponding institutional requirements through joint mission and institutional planning.

A significant amount of planning is performed within Mission Directorates and at the Centers in developing and implementing the technical requirements for Agency programs and projects. Headquarters Mission Support Offices (MSOs) and Center mission support organizations also conduct routine planning sessions to anticipate and prepare to meet Agency mission support needs (workforce, infrastructure, etc.). While some coordination occurs between program/project personnel and Headquarters/Centers mission support personnel, currently there is no systematic process or mechanism to ensure collaboration. Therefore, Headquarters and the Centers will work with program/project offices to formalize and institutionalize a collaborative, joint planning process that requires program/project managers to include Headquarters/Center mission support staff early in the life cycle process to ensure adequate support at all times.

MSG-2: Secure and align the skills, competencies, resources, and capabilities necessary to execute Agency missions effectively and efficiently.

Once adequate planning is in place to determine program/project needs for mission support, all NASA mission support offices will be responsible and accountable for delivering services and support to meet those needs. For example, program and Center offices need testing facilities with adequate capacity to meet their program/project needs. Currently, NASA has a misalignment primarily due to the Agency's transition from operations (Space Shuttle and International Space Station) to development (Constellation) activities. However, understanding the nature of, and reasons for, the misalignment is only part of the solution. The Agency must make an effort to align existing assets with mission needs, and then focus on creating or acquiring new capabilities if/when existing assets cannot be modified or enhanced to meet new requirements. Aligning existing assets includes seeking and seizing opportunities to use infrastructure owned by other government agencies, industry, academia, and international organizations, and/or seeking out potential new partnerships. NASA also must eliminate the assets the Agency no longer needs.

MSG-3: Create institutional flexibility by ensuring tools and processes are in place to respond to changing mission needs.

Since the Agency's creation in 1958, NASA has built and maintained institutional capabilities sufficient to achieve the Agency's Mission. Much of the Agency's infrastructure have been in place since the early days of NASA. This stability created a

positive sense of permanence that served NASA well through the Apollo, Space Shuttle, and Space Station eras. However, the negative effect is the Agency's new realization that to meet evolving requirements efficiently, NASA needs more flexible infrastructure and capabilities. Special legislation, like Enhanced Use Leasing, allows the Agency to leverage existing, underutilized assets to benefit NASA. By seeking, exploiting, and encouraging more tools like this, NASA can adapt better to changing circumstances and become more resilient.

MSG-4: Evaluate external requirements and expectations to optimize Agency missions.

NASA is committed to comply with external requirements. The key is to find the balance between meeting the externally imposed requirements and achieving NASA's Mission. Therefore, the immediate focus will be to explore ways of complying with the requirements while contributing more directly to mission success. NASA's external requirement strategy includes:

- Applying a filter of mission success/enablement, and careful stewardship of our resources into how we comply with the external requirement;
- Embedding the mission impact evaluation as part of our on-going business process; and
- Proactively evaluate mission impacts with external entities as the requirements are being formulated and developed, and negotiating outcomes that minimize mission impacts before the requirements are finalized

Over time, implementing these strategies should enable NASA to establish a more balanced, mission-driven portfolio for the mission support organizations to manage.

MSG-5: Optimize Agency decision-making by integrating accurate, timely, and relevant institutional information with program and project information to contribute to overall efficient use of resources and cost effectiveness.

Integrated technical and institutional information has not been available consistently to support NASA's decision-makers. Therefore, the mission support organizations will develop a rigorous process that integrates technical and institutional information and ensures the availability, accuracy, and usefulness of this information to support key decisions.

MSG-6: Improve Agency risk management by integrating institutional, programmatic, and strategic risk management.

In accordance with NASA policies, program and project managers use technical risk principles and processes in executing their oversight responsibilities. Mission support managers, including Center institutional managers, oversee institutional services and capabilities that also may be on the critical path to program/project success. However, institutional risk historically has not been considered on the same level as technical risk to a program or project and has not been fully included in the program and project risk management plans.

MSG-7: Sustain long-term mission viability by deploying processes, techniques, and innovations that meet today's requirements without compromising the ability to meet future needs.

The robust exploration program envisioned by the President will require that NASA managers make some short-term decisions without benefit of having detailed information about the long-term operational impacts on future missions. While such decisions are necessary in research and development work, NASA will minimize potential long-term negative impacts by focusing on sustainable practices, flexible designs, adaptable processes, and creative thinking to meet short-term mission needs. NASA also will create opportunities for future innovations that could resolve potential problems that today's actions may create.

The following table illustrates how the 6 Strategic Goals outlined in the NASA Strategic Plan cross-map to the 7 Mission Support Goals.

	MSG-1	MSG-2	MSG-3	MSG-4	MSG-5	MSG-6	MSG-7
Strategic Goal 1: Fly the Shuttle as safely as possible until its retirement, not later than 2010	x	x	x	x		x	x
Strategic Goal 2: Complete the International Space Station in a manner consistent with NASA's International Partner commitments and the needs of human exploration	x	x	x	x	x	x	x
Strategic Goal 3: Develop a balanced overall program of science, exploration, and aeronautics consistent with the redirection of the human spaceflight program to focus on exploration	x	x	x	x	x		x
Strategic Goal 4: Bring a new Crew Exploration Vehicle into service as soon as possible after Shuttle retirement	x	x	x	x	x	x	x
Strategic Goal 5: Encourage the pursuit of appropriate partnerships with the emerging commercial space sector		x	x	x			x

Strategic Goal 6: Establish a lunar return program having the maximum possible utility for later missions to Mars and other destinations	x	x	x	x	x	x	x
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2.2 High-Impact Objectives

The seven Mission Support Goals described in Section 2.1 will help NASA achieve the Agency's Strategic Goals and Sub-goals and enabling mission success through managing institutional risk to mission through close coordination between the technical programs and NASA's mission support organizations. The Focus Area Documents, Sections 6.1 through 6.5, identify 17 sub-goals and 57 objectives that align directly to one or more of the seven Mission Support Goals and describe more specifically the purpose of integrating mission support within each MSO area to ensure mission success.

A cross section of Agency representatives from NASA Headquarters and the Centers assessed the consequences and potential impacts to the Agency of not accomplishing each of the 57 mission support objectives³. As a result of this assessment, they identified 24 of the 57 as high impact objectives. The Agency MSOs will focus on these 24 objectives during the first phase, and these 24 objectives will be rolled into the high-level decision-making during the upcoming Planning, Programming, Budgeting, and Execution (PPBE) budget cycle.

The following table illustrates how the Focus Area Sub-goals and 24 top Objectives relate to the 7 Mission Support Goals.

Focus Area Sub-Goals High Impact Objectives	Mission Support Goals						
	1	2	3	4	5	6	7
WORKFORCE							
WF-1: Identify workforce requirements and develop plans to support mission needs, with sufficient flexibility to accommodate potential programmatic changes.	x	x	x				x
WF-1A: Based on current and projected mission needs, assess workforce requirements against availability and determine best method - or combination of methods - to meet needs, taking into consideration need to maintain core in-house capabilities, external requirements and constraints, as well as flexibility needed for the future.	x	x	x				x

³ NASA Sr. Managers met at an MSP Risk Management Workshop on November 7 – 9, 2006

WF-2: Ensure the needed workforce is available and aligned to achieve the mission efficiently and effectively.	x	x	x		x		x
WF-2A: Obtain high quality civil service workforce and ensure its alignment with the mission and its flexibility, as needed, over the long term.	x	x	x		x		x
WF-3: Build and sustain core in-house workforce capability, including leadership strength, needed to carry out NASA's mission efficiently and effectively.	x	x	x				x
WF-3A: Develop and sustain the core in-house science, engineering, and program and business management capability needed to conduct and support the mission.	x	x	x				x
WF-3B: Develop leadership ability at all levels and ensure leadership continuity, particularly in key positions.	x	x	x				x
WF-4: Provide information to allow sound decision-making concerning workforce planning, acquisition, and management.	x	x	x				x

INFRASTRUCTURE	1	2	3	4	5	6	7
IN-1: Obtain mission needs by conducting joint planning early and throughout the lifecycle of program and projects.	x	x	x	x	x		x
IN-1B: Ensure the formal integration of institutional considerations into programs and projects from project inception to completion and final asset disposition to provide more effective support to the mission.	x	x	x		x		x
IN-1C: Prioritize and allocate infrastructure resources to balance optimal support of mission needs with externally levied requirements.	x	x		x	x		x
IN-2: Ensure that infrastructure, assets, and capabilities are aligned and configured to mission and available when needed.	x	x	x		x		x
IN-2A: Leverage and size assets, capabilities and resources to meet mission needs, eliminate excess capacity, and scale asset performance accordingly.	x	x			x		
IN-2C: Transition shuttle infrastructure assets as appropriate, by developing and implementing disposition plans of unneeded assets to effectively and efficiently support the Vision for Space Exploration.	x	x			x		x

IN-3: Implement risk mitigation and sustainability practices across the Agency's infrastructure to prevent adverse mission impacts, protect mission resources, and enable the NASA mission to the fullest extent possible.	x	x			x	x	x
IN-3A: Integrate continuous risk management practices into the life cycle management of NASA's infrastructure to enhance mission support and sustainability.						x	x
IN-3B: Enhance mission performance and reduce life cycle costs of operations, maintenance, and disposition of infrastructure assets to ensure maximum funding is available to mission programs and projects through sustainability design practices and the implementation of new technologies.	x	x			x		

FINANCE	1	2	3	4	5	6	7
FI-1: Ensure effective financial planning to meet the Agency's long-term mission requirements.							x
FI-1AP: Implement a process for assessing long-term financial resource needs, relative to Agency long-term mission plans.							x
FI-2: Align financial resources to the Agency's strategy.	x	x			x		
FI-2A: Align Agency planning and budget requests to clearly and comprehensively support Mission requirements.	x	x					
FI-2B: Execute Agency funding decisions in a manner consistent with approved Agency mission and institutional plans.	x				x		
FI-3: Maximize funding for the mission.	x	x					x
FI-3C: Embed effective internal controls in all Agency financial management processes and practices.	x	x					x
FI-4: Provide reliable, accurate, and timely financial resources information for decision-making purposes.			x		x		
FI-4B: Provide effective, easy-to-use financial and resource management information systems and reporting tools.			x		x		
FI-4C: Integrate financial information systems, processes and data with other Agency (HR, Procurement, etc.) information systems, processes and data			x		x		

INFORMATION SYSTEMS	1	2	3	4	5	6	7
IS-1: Ensure operational information systems and services meet NASA mission and institutional requirements in the optimal manner, considering and balancing resource constraints, external requirements, and mission priorities.	x	x			x		
IS-1A: Provide information and information technology solutions across NASA's portfolio elements that meet NASA's requirements in an optimal manner (centrally-managed/centrally-provided, centrally-managed/locally-provided, and/or locally-managed/locally-provided).		x			x		
IS-1C: Conduct joint planning with mission entities on current information system and services performance and future requirements.	x						
IS-2: Ensure new investments in IT systems and services are appropriately selected, controlled and evaluated based on Agency priorities and requirements.		x			x		
IS-2B: Identify information and services gaps and overlaps, and develop/execute plans to ensure NASA has the proper information for decision-making and proper services to conduct mission and institutional activities.		x					
IS-2C: Prioritize and select investments based on gap analyses, approved business cases and enterprise architecture reviews, balancing the optimal support of mission needs with externally levied requirements.		x		x			
IS-3: Ensure the confidentiality, integrity, and availability of NASA information and information systems based on the categorization of the information processed by, or stored within, the systems.		x		x			x
IS-3A: Ensure information technology security is incorporated throughout the system life-cycle.		x		x			x

MANAGEMENT SYSTEMS	1	2	3	4	5	6	7
MS-1: Understand the components of the integrated Agency management systems and implementing models to provide a baseline for measuring and improving the current processes, policies, procedures and tools.					x		
MS-1B: Map the baseline integrated system of management system architecture, including the interdependencies, intersections and combined products.					x		
MS-2: Ensure that an effective internal management controls system is developed and implemented.		x			x		x
MS-2A: Identify gaps and deficiencies between processes, policies, procedures and tools in, and/or barriers to success in fulfilling the purpose of the integrated system of management systems, and individual management system models.		x			x		
MS-2C: Institute an on-going monitoring and reporting set of organizations, processes and procedures to track progress toward removing gaps and deficiencies, and ensuring the effectiveness and efficiency of the management systems.					x		x
MS-3: Remove known existing deficiencies in the NASA management systems, including integration deficiencies.		x			x		

3.0 Mission Support Performance Management

NASA's ability to meet the Agency's Strategic Goals is the key determinant of mission success.

3.1 Performance Measures

To ensure that all programs, projects, and Agency initiatives focus on the Agency's Strategic Goals and Sub-goals, NASA program managers annually update and/or develop a set of programmatic performance measures: multi-year performance Outcomes aligned to each Strategic Goal and Sub-goal; and a set of one-year Annual Performance Goals (APGs) aligned to each Outcome. NASA Program Managers also identify specific mission (programmatic) performance commitments, including cost, schedule, and deliverables, that support achievement of the Outcomes. Together, these strategic and programmatic measures form an Annual Performance Plan that is an integral part of NASA's annual Integrated Budget and Performance Document (IBPD).

Currently, a clear set of integrated Agency-level institutional performance measures does not exist. Historically, individual Mission Support Offices and Centers developed institutional performance measures for their functional areas. However, there has been little linkage of these institutional performance measures to NASA's programmatic measures and even weaker connection of the institutional measures to NASA's strategic measures. An important function of the new MSP process and the MSP is to define the first integrated set of institutional goals, objectives, and associated performance measures against which NASA can monitor and evaluate mission support performance.

3.2 Performance Monitoring and Reporting

NASA monitors and reports on programmatic measures externally and internally. The Agency reports progress toward achieving NASA's strategic directions as indicated by the programmatic measures in the annual Performance and Accountability Report (PAR). The programmatic measures are internally tracked and monitored by the NASA Program Management Council through the State of the Agency – Program/Projects process. A similar internal structure will be created for the institutional measures.

NASA will begin monitoring mission support performance across the Agency by tracking the goals and objectives identified in the MSP. The Agency will measure progress against the outcomes through the Focus Area Document measurements and metrics and create an Annual Performance Goal (APG) format similar to those used to monitor programmatic and strategic performance. NASA's Annual Performance Plan and PAR will not include the institutional APGs; these measures will be tracked and monitored by the Operations Management Council.

NASA managers will use additional forums, such as the Mission Support Plan Implementation Weekly Meeting with the Deputy Administrator, to oversee and manage Agency-level institutional performance, and they will make adjustments or course corrections based on an analysis of the performance data.

As described in the Focus Area Documents (Section 6), Focus Area Leads will track objectives and lower-level performance metrics. The process for tracking, monitoring, and reporting mission support performance at all levels will be described in the forthcoming MSP procedural requirements document.

4.0 Risk Management

Mission Support Offices exist to enable and enhance mission success. The Agency will accomplish this by managing institutional risk to mission and by improving risk management at all levels. The MSP identifies the first set of NASA-level institutional risks. A defined method for monitoring these risks and implementing corrective action will follow.

4.1 Risk Management Oversight

NASA will oversee and manage Agency-level institutional risks in a number of ways. It is the responsibility of the Focus Area Leads (as identified in the Focus Area Documents) to monitor the risks and potential barriers to accomplishing High-Impact objectives and to elevate “risks of concern” to the appropriate Headquarters entity. The Focus Area Leads, with the MSP Lead, will report these risks to the NASA Operations Management Council, and the Council will track the risks and take appropriate action.

4.2 Managing Risks to Achieving High-Impact Objectives

The initial focus of attention for the MSOs during the first phase of MSP implementation will be on the issues and risks to meeting the 24 High-Impact Objectives (See Section 2.2).

Analysis of the issues and risks described in the Focus Area Documents revealed the existence of four common, significant institutional issues and risks. The Focus Area Documents, Section 6, describe these issues and risks in detail. Mission support organizations currently are developing mitigation and budget strategies for these risks.

The four issues/risks are:

- A Lack of integrated planning between NASA Programs and Projects, MSOs and Centers.
- A Lack of consistent, NASA-wide institutional approaches and tools, including the lack of common definitions and standards for risk.
- MSOs are currently not consistently applying the filter of mission success/enableness into how NASA complies with external requirements.
- There may currently be a gap between the resources required to pursue and achieve Mission Support Goals and the resources currently available.

5.0 MSP Document and Governance Flow

The governance structure of the MSP is from the Deputy Administrator via the Operations Management Council (OMC) to the Program and Project Managers (as illustrated in Figure 1.0). The MSP Leads will report to the OMC on trends analysis across the Focus Areas. Their reports will be based on the Focus Area Leads' reporting of measures, metrics, and risks. In turn, the Focus Area Lead's reporting comes from the MSOs' data reporting, which in turn comes from the Centers' reporting, requirements, metrics, and policy. The Centers' reports come from their Functional Offices, who also incorporate information from the Program and Project Managers.

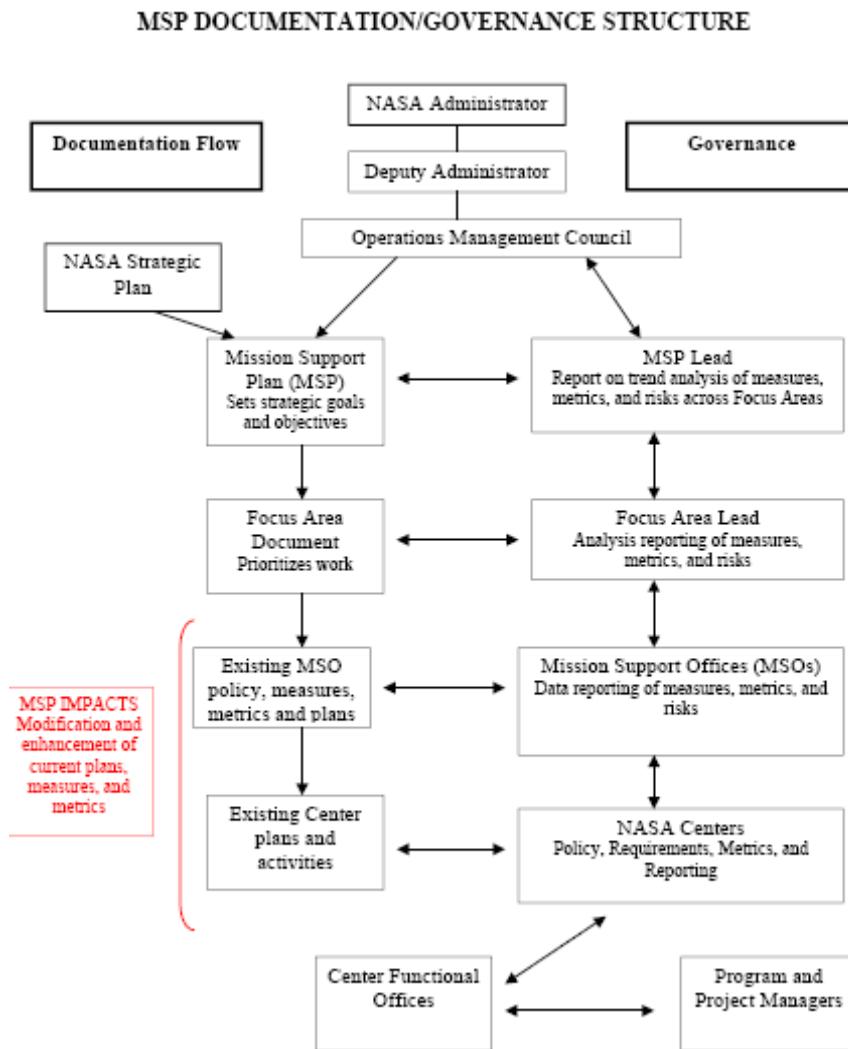


Figure 1.0

6.0 Focus Area

6.1 Focus Area Document – Workforce

Workforce Lead: Assistant Administrator, Office of Human Capital Management
Point-of-Contact: Toni Dawsey

Overview

NASA's most important resource in achieving the goals of the Vision for Space Exploration is the workforce. As NASA's history has demonstrated, it is the people – with the requisite skills and training and led by individuals with a clear commitment to NASA values – who will assure mission success.

The NASA Strategic Plan specifically addresses workforce issues, recognizing the importance of identifying, acquiring, and maintaining the core competencies needed to achieve the Vision and NASA's aeronautics and science missions. The Strategic Plan also recognizes that the Agency must develop a workforce flexible enough to adapt to any significant change in mission requirements. The flexibility is needed to support current issues such as the Space Shuttle transition but also to position the Agency to respond more nimbly to future mission changes. In addition, the Strategic Plan highlights NASA's reliance on its partners – industry, academia, other government agencies, and international partners – to achieve the Agency's missions and Vision and states the Agency's intention to engage a larger pool of innovators and potential partners through innovative partnerships.

These themes are reiterated in the Strategic Management and Governance Handbook, which identifies “strategic management of human capital” as one of the guiding principles of NASA's strategic management approach. The Handbook speaks to the importance of issues such as long-term workforce planning, the need for increasing workforce flexibility, and the need to reduce the risk of developing gaps or difficult-to-manage surpluses in needed competencies. It also outlines the need to pursue a strategy to take advantage of state-of-the-art techniques, methodologies, and solutions available within NASA, industry, academia, other federal agencies and other partners while preserving institutional expertise and strength.

In addition, the NASA Workforce Strategy – submitted to Congress in April 2006 – identified three underlying NASA civil service workforce principles: building and sustaining healthy Centers; maximizing the use of NASA's current human capital capabilities; and evolving to a more flexible, scalable workforce.

I. Scope and MSO Involvement

Scope: The Workforce Focus Area is concerned with the strategic management of human capital; i.e. that policies, processes, practices, and structure are in place to ensure that critical workforce skills and capabilities are available and effectively used in the timeframe needed to enact the major activities of the Agency's mission.

Given that the Agency accomplishes its mission leveraging the skills and expertise of its in-house civil service workforce with support of industry, academia, and other partners, the scope of the Workforce Focus Area addresses not only the civil service workforce but also other ways in which the Agency's work is accomplished. However, while NASA contractors are vital to the success of the Agency's mission – with on- and near-site contractor workforce significantly outnumbering NASA civil servants – it is essential that we recognize the contractual nature of the relationship between the Agency and its contractors. NASA manages its contracts through the procurement process, while contractors manage their workforce. Any focus on accomplishing NASA's work outside the civil service workforce must be addressed by the appropriate parties within the procurement process, with adherence to appropriate legal and regulatory constraints. The same is true of NASA's relationships with academia and other partners. The terms of the relationship are spelled out in the terms and conditions of the grant or other legal instrument. A specific objective, therefore, is included that addresses the planning, execution, and management of *contractual instruments* and other types of *agreements* through which NASA acquires external support and expertise.

MSO Involvement: Workforce issues, by their very nature, cross many organizations and technical disciplines. Besides the Agency HR community – led by the Office of Human Capital Management (OHCM), working with the Mission Directorates, Mission Support Offices, and Centers – key offices directly involved in carrying out supporting tasks to achieve the Workforce objectives are: 1) the Office of Diversity and Equal Opportunity in ensuring an open and inclusive environment; 2) the Office of Education in assisting in the development of new sources of science, technology, engineering and math (STEM) talent; and 3) the Office of the Chief Engineer in enhancing in-house program/project management and systems engineering expertise. Many other organizations, however, also contribute to effective workforce management. The Offices of Program and Institutional Integration and Program Analysis and Evaluation, for example, play major roles, along with the HR community, in strategic workforce planning and shaping.

In addition, the Offices of Chief Safety and Mission Assurance Officer, Security and Program Protection, and Chief Health and Medical Officer, respectively, among their many responsibilities, work to ensure a safe and secure work environment and the health and well-being of the NASA workforce. The Office of the Chief Information Officer and the Office of the Chief Engineer may, respectively, provide and/or identify IT and engineering tools that enable inter-Center teams to conduct programs and projects.

On the procurement side, the Office of Procurement ensures the development of acquisition strategies, policies, and innovative approaches to acquire support from the contractor community and academia – and works with the Office of Small and Disadvantaged Business Utilization to ensure that the small business community has the opportunity to participate in doing business with NASA.

II. Sub-goals and Objectives

The Workforce sub-goals are structured around the concepts of: workforce planning; acquiring and aligning the civil service workforce and acquiring other external sources of support and expertise; developing and sustaining the civil service workforce; and better informed decision-making around workforce management through integrated, reliable workforce data.

Sub-goal WF-1: Identify workforce requirements and develop plans to support mission needs, with sufficient flexibility to accommodate potential programmatic changes.

Sub-goal WF-1 addresses strategic workforce planning, including make-or-buy decisions (i.e., performance by in-house civil service vs. contract), integrated with program and business planning. Effective workforce planning is an essential component in assuring that NASA has the workforce needed to achieve its mission objectives. In a time of tight budgets and aggressive schedules, the Agency must ensure that it has a workforce planning process that links program/project, budget and workforce requirements, and is able to identify workforce needed to support the Vision and missions of NASA.

Objective WF-1A: Based on current and projected mission needs, assess workforce requirements against availability and determine best method – or combination of methods – to meet needs, taking into consideration the need to maintain core in-house capabilities, external requirements and constraints, as well as flexibility needed for the future.

The objective deals with more strategic, robust workforce planning, particularly Agency-wide workforce planning, that is better integrated with the planning of the work itself and with other business planning processes. Through a more integrated process, the Agency can better assess the existing skills and competencies of the current workforce against forecasted requirements, identify potential misalignments (surplus and shortage), and determine the appropriate means of getting work done.

This objective commits the Agency to enhancing existing workforce planning processes and developing new long-term planning processes. Not only will these changes integrate workforce planning with the annual budget planning cycle, but they will also support better multi-year planning across a spectrum of issues. Policies will be developed for total workforce management that will address issues such as contractor-civil service balance. OHCM will work with all stakeholders, including Mission Directorates, Programs, Centers and Mission Support Offices to build common practices and structure across the Agency. Carrying out the objective will involve the Office of Human Capital

Management working with the Office of the Chief Engineer, the Office of the Chief Financial Officer, and the Office of Program Analysis and Evaluation to integrate workforce planning with program/project and business planning processes (e.g., NPR 7120.5 and the Program, Planning, Budgeting, and Execution (PPBE) process). The objective addresses improved Agency strategic planning guidance to Centers, clear workforce policies, enhanced workforce planning tools, and development of measures (beyond “budget/full-time-equivalent” measures) to assess workforce capacity and capability and risks of misalignments. It will also consider the requirements of OMB Circular A-76 and the Federal Activities Inventory Reform (FAIR) Act, as well as procurement planning processes under the cognizance of the Office of Procurement.

Objective WF-1B: Plan for and manage the risk to mission of uncertainty in projected workforce requirements beyond the near-term budget horizon.

This objective highlights scenario – “what if” – planning as part of enhanced workforce planning capability. It envisions the inclusion of work or program scenarios with the planning process, as a mechanism for capturing and documenting the variability of work Centers may face and assist them in resource planning. Any given scenario could contain more than one variable (schedule, work content, work assignment, budget, etc.). The capability to do longer-term, futuristic scenario planning, beyond the near-term budget horizon, will also be pursued. The Office of Human Capital Management will work with the Mission Directorates, the Office of the Chief Financial Officer, the Office of Program Analysis and Evaluation, and the Centers to establish appropriate scenarios, analyses of alternatives, etc.

Sub-goal WF-2: Ensure the needed workforce is available and aligned to achieve the mission efficiently and effectively.

Information derived from sound workforce planning will support timely decision-making regarding the acquisition and alignment of skills needed to support programs. The workforce must include the right balance of permanent and term civil service staff and contractors, and strategies must be developed that enable workforce flexibility based on changes in mission requirements. The Agency must also look to future availability of needed skills.

Objective WF-2A: Obtain high quality civil service workforce and ensure its alignment with the mission and its flexibility, as needed, over the long term.

Objective WF-2A involves aligning recruitment programs and civil service workforce reshaping efforts to meet the Agency’s needs through a diverse workforce with requisite skills.

NASA's human capital management challenges are greater than ever. The Agency must complete the International Space Station, retire the Space Shuttle, develop new transportation and launch and support systems, maintain a robust science portfolio, and

re-focus its aeronautics program in core disciplines and research areas appropriate to NASA's unique capabilities. In order to do this in a resource-constrained environment, the Agency must ensure that it has plans and tools in place to acquire the civil service skills it needs for mission success – whether through recruitment or retraining. It must also have the ability to address areas of excess capacity, and to transition or reshape the workforce with minimal disruption. Retraining activities, change management, and transition tools, such as early out/buyout authority and career transition assistance, are included under this objective.

The Office of Human Capital Management and the Agency HR community will lead efforts to ensure the Agency has the appropriate programs, processes, and tools to acquire and reshape the civil service workforce. The Office of Human Capital Management will partner with the Mission Directorates, the Office of Program and Institutional Integration, and the Office of Program Analysis and Evaluation; coordinate with organizations such as the Office of Diversity and Equal Opportunity and the Office of General Counsel to ensure that such programs, processes, and tools address outreach and diversity considerations and legal requirements; and consult with NASA's unions.

Objective WF-2B: Plan, execute, and manage instruments to acquire external expertise efficiently and effectively, fostering innovation where desired.

This objective addresses the accomplishment of Agency work via means other than NASA's civil service workforce through the planning, execution, and management of contracts, grants, and other types of agreements and innovative partnering arrangements. The focus is on creating and best utilizing new and/or traditional business approaches, technologies and methodologies to support the evolving mission portfolio in a challenging external environment; continuously improving the Agency acquisition process, anticipating evolving Agency needs; and creating acquisition strategies that will lay the foundations for multi-decadal programs while promoting successful conclusion of existing programs.

The Office of Procurement leads the development and implementation of policies, acquisition strategies and mechanisms, as necessary, to provide innovative approaches to acquiring contract support from external sources. It works closely with the Office of General Counsel and also coordinates with the Office of Small and Disadvantaged Business Utilization to ensure that small and small disadvantaged businesses have the opportunity to participate in NASA's contracted work through regulatory coverage and guidance that support implementation of socioeconomic programs and policies.

Objective WF-2C: Ensure a robust pipeline of future talent exists to meet projected future workforce needs.

Objective WF-2C deals with how NASA may contribute to ensuring a continued potential pool of talent with skills the Agency – and its partners – will need for the future. This includes contributing to the development of the science, technology, engineering, and math (STEM) workforce in disciplines needed to achieve NASA's strategic goals,

through a portfolio of investments. It also addresses attracting and retaining students in STEM disciplines through education support materials to enhance student skills and proficiency in STEM disciplines and opportunities for students, teachers and faculty to engage in authentic NASA-related, mission-based R&D activities.

The Office of Education leads the development, realignment, and management of education programs and investments to aid in the development of the STEM workforce in disciplines needed to achieve NASA's strategic goals for the long term, based on projected core competency needs identified by the Office of Human Capital Management, and working with the Mission Directorates, PA&E, and the Centers. In addition, the Office of Human Capital Management and Centers offer employment opportunities for students through such programs as the co-operative education program, and the Office of Diversity and Equal Opportunity leads a variety of outreach efforts to facilitate a diverse pool of potential talent. The Office of Education, the Office of Human Capital Management, and the Office of Diversity and Equal Opportunity will also work to create a better link between Agency education programs and hiring efforts.

Sub-goal WF-3: Build and sustain core in-house workforce capability, including leadership strength, needed to carry out NASA's mission efficiently and effectively.

The scope of sub-goal WF-3 is concerned solely with developing and managing the Agency's civil service workforce, since contractors are responsible for developing and managing their personnel.

Objective WF-3A: Develop and sustain the core in-house science, engineering, and program and business management capability needed to conduct and support the mission.

The Agency must have a civil service workforce with the right skills and competencies at the right time in order to accomplish its mission and implement the Vision. Developing and sustaining a workforce that is technically trained – particularly in those technical and business management capabilities that the Agency must maintain in-house – as well as agile and scalable – to respond to mission changes – is critical to achieving NASA's goals. This objective covers the training and development of the Agency's civil service workforce and includes such efforts as developing and strengthening program/project management and systems engineering competencies (particularly in a design and development environment), and facilitating knowledge sharing and lessons learned in these areas – as well as establishing approaches and mechanisms for developing and enhancing mission support/business skills and competencies. Career paths and mentoring strategies to support improved technical and business excellence will be pursued.

The Office of Human Capital Management partners with other functional offices to establish and maintain appropriate business management training and development, including career paths, designed to ensure that mission support functions continue to facilitate successful accomplishment of Agency programs and projects. The Office of the

Chief Engineer, working with the Office of Human Capital Management and others, takes the lead in developing in-house program/project management and engineering expertise.

Objective WF-3B: Develop leadership ability at all levels and ensure leadership continuity, particularly in key positions.

Objective WF-3B focuses on the need to maintain a strong leadership capability within the Agency's civil service workforce now and in the future. It encompasses leadership development at all levels, the creation of a succession management system, and effective leadership coaching and mentoring activities. The Office of Human Capital Management will evaluate current leadership development programs and revise them, as appropriate, to ensure that requisite leadership capabilities are being enhanced in the civil service workforce.

Objective WF-3C: Establish and maintain an environment (including supporting systems, structures, tools, and processes) that enables the productivity, teamwork, shared focus, and contribution to mission needed for success.

This objective is extremely broad in scope and includes those things that can help or hinder the productivity of NASA's civil service workforce, including: performance management systems and rewards and recognition that clearly align with Agency goals; knowledge management efforts; effective internal communication; a safe, healthy, and secure workforce and work environment; and IT and engineering tools and processes to permit cross-center teams to work together more effectively, particularly when work packages are assigned to various Centers.

The Office of Human Capital Management will strengthen the linkage between employee and organizational performance to ensure that all individual performance is focused on achieving the performance objectives of the organization and the Agency.

Other organizations play a significant role in creating a work environment conducive to facilitating achievement of NASA's missions. Among them:

- The Office of the Chief Engineer provides policy direction, oversight, and assessment for NASA engineering and program/project management. It also serves as the principal advisor to the Administrator and other senior officials on matters pertaining to technical readiness in execution of NASA programs and projects and is responsible for Agency-level standards and policies as applied to engineering and program management.
- The Office of the Chief Health and Medical Officer leads efforts to foster optimal health of employees throughout their NASA career and beyond, employing an evidence-based occupational and preventive health care system, with appropriate and timely interventions.

- The Office of Safety and Mission Assurance (OSMA) is responsible for leading efforts to maintain a strong safety culture throughout the Agency, in part, through comprehensive, well-integrated engineering and management processes oriented towards safety and mission success and a robust system of checks and balances, as well as through SRM&QA requirements and tools used by the NASA team to maximize the chance of safety and mission success for all programs.
- The Office of Security and Program Protection leads activities designed to ensure a secure environment (e.g., protecting people, assets, technology, information, and classified data) so that NASA may successfully accomplish its varied missions.
- The Office of Diversity and Equal Opportunity provides policy, direction, training, and oversight of anti-discrimination Federal statutes and implementing rules to nurture an environment of inclusion and reduce liability risk in accomplishing the Agency's mission.

Sub-goal WF-4: Provide information to allow sound decision-making concerning workforce planning, acquisition, and management.

In order to know whether the Agency does a good job of workforce planning, acquiring and aligning internal skills and competencies and external support and expertise, and developing and sustaining in-house capabilities – and to make better informed decisions in those areas – NASA must have reliable and useful data and methods of measurement.

Objective WF-4A: Develop workforce measures that could be used to assess risks associated with the current and future workforce, including civil service, support service contracts, and others.

Objective WF-4A covers the development of effective measures that can be used to assess risks associated with the current and future ability to get work accomplished. Because the scope of the Workforce Focus Area includes the conduct of work through external sources of support/expertise (particularly through contracts), as well as through an in-house civil service workforce, the types and sources of data and associated performance measures are very disparate. No comprehensive, integrated set of measures currently exists to give the Agency a complete picture. Work conducted under this objective will help move the Agency toward the establishment of a more comprehensive set of workforce measures.

The Offices of Human Capital Management and Procurement will lead development of appropriate measures for civil service workforce management (see objective WF-4B below) and contract management, respectively. The Office of Program Analysis and Evaluation will manage the incorporation of such measures into appropriate Agency management systems.

Objective WF-4B: Ensure information related to civil service workforce management is accurate, reliable, and available in a timely manner to support decision-making at all levels.

Objective WF-4B deals with workforce data specifically about the civil service workforce, designed to give managers at all levels, the employees, and the HR function greater insight into civil service workforce management issues and assist in decision-making. Information about people, when integrated with financial and other information, will enable NASA to strategically plan its workforce for mission success. Comprehensive, authoritative information with near real-time access will enable agility and flexibility in responding to changing program requirements. This objective represents a commitment to provide the information NASA managers need to ensure the workforce is aligned with the current and planned work of the Agency, and support long-term planning and forecasting. This objective also supports the mission by maintaining accountability for human capital decisions that support Agency readiness. The Office of Human Capital Management has lead responsibility for this objective.

High Priority Objectives

The above sub-goals and objectives represent a daunting workload. Through a series of exercises conducted during the MSIP Risk Management Workshop, held November 7 – 9, 2006, representatives from the Mission Support Offices, Mission Directorates, and Centers placed the Workforce objectives into 3 groupings, of approximately equal numbers, designated as “high,” “medium,” and “low” priority based on the consequences to the Agency of not achieving each objective. Consequences were identified on the basis of:

1. Impact on Resources
2. Impact on Management Effectiveness/Efficiency
3. External Implications and
4. Future Sustainability.

In prioritizing the Workforce objectives, it was recognized that all were significant and merited attention. Within the scope of the Workforce Focus Area, however, certain objectives stood out. Of the 10 objectives, the following four were determined to be the most critical in the short-term:

1. **WF-1A:** Based on current and projected mission needs, assess workforce requirements against availability and determine best method – or combination of methods – to meet needs, taking into consideration the need to maintain core in-house capabilities, external requirements and constraints, as well as flexibility needed for the future.
2. **WF-2A:** Obtain high quality civil service workforce and ensure its alignment with the mission and its flexibility, as needed, over the long term.

3. **WF-3A:** Develop and sustain the core in-house science, engineering, and program and business management capability needed to conduct and support the mission.
4. **WF-3B:** Develop leadership ability at all levels and ensure leadership continuity, particularly in key positions.

III. Performance and Accountability

Workforce-related measurement and assessment are essential in aiding NASA leaders and supervisors to effectively manage the Agency workforce. Measurement and assessment assist in identifying areas for improvement and/or increased emphasis, assessing whether existing activities and initiatives are producing the desired results, and ultimately, ensuring that workforce-related programs and policies support the Agency's readiness to carry out the Vision for Space Exploration and NASA's missions of science and aeronautics research.

The following workforce capability measures were briefed to the Operations Management Council on January 10, 2007, and to the Strategic Management Council on January 17, 2007. Data is expected to be collected annually as part of the PPBE process. Although the measures are grouped under Workforce sub-goals WF-2 and WF-3, the desired outcomes cannot be achieved without sound workforce planning (WF-1) and the availability of comprehensive, reliable workforce data (WF-4).

Sub-goal WF-1: Identify workforce requirements and develop plans to support mission needs, with sufficient flexibility to accommodate potential programmatic changes.

Sub-goal WF-2: Ensure the needed workforce is available and aligned to achieve the mission efficiently and effectively.

- **Outcome Measure: Scalability** – Extent to which Centers are able to adjust number of full-time equivalent (FTE) and work-year equivalent (WYE)) of different types quickly enough to meet changes in workforce demand within an anticipated range of future work.
- **Outcome Measure: Skill Availability and Access** – Extent to which Centers have access to needed competencies (civil service or contract) at an acceptable quality level for the range of anticipated work.
- **Outcome Measure: Performance and Proficiency** – Extent to which civil service and contract performance is (or is anticipated to be) reliable for the range of work – particularly with work that is new, high risk, or inflexible in terms of schedule or cost.
- **Outcome Measure: Utilization** – Degree to which the civil service workforce is used efficiently to perform the work of the Centers.

Sub-goal WF-3: Build and sustain core in-house workforce capability, including leadership strength, needed to carry out NASA’s mission efficiently and effectively.

- **Outcome Measure: Sufficiency** – Degree to which Centers have sufficient capacity, appropriate skill mix, and competence within the civil service workforce to fulfill management and oversight responsibilities.
- **Outcome Measure: Sustainability** – Extent to which Centers have sufficient “bench strength” over time to sustain appropriate levels of internal capacity in key business, technical, and managerial positions to grow in-house skills and replace workforce as they move up or out.

Sub-goal WF-4: Provide information to allow sound decision-making concerning workforce planning, acquisition, and management.

IV. Issues and Risks

Among the most significant issues and/or problems that may prevent the Agency from achieving the high-impact Workforce objectives are the following:

Issue #	Issue/Problem Statement	Impact to Focus Area Document	Remediation Approach
WF-I1	Resources are insufficient (e.g., travel funds, staffing) to accomplish required activities, particularly given that there are also competing demands on resources due to external requirements and normal functional management.	Several Focus Area Document activities may have to be scaled back or delayed, resulting in delay or failure in achieving workforce Focus Area objectives and increased risk to mission.	Consolidate meetings/conferences. Use electronic alternatives (VITS, WebEx, etc) as feasible, recognizing their limitations. Where reasonable, request extensions for, exemptions to, or flexibility in implementing, external requirements that do not support mission, so that mission-required activities can proceed as planned and on schedule. Focus resources on highest priority actions and scale back/delay others, as necessary.
WF-I2	The breadth of activities requires coordination and commitment across multiple functional and programmatic communities, which will be difficult to achieve.	Delay or failure to achieving workforce Focus Area objectives may result.	Undertake aggressive change management and education activities. Solicit and use buy-in from senior leadership. Use existing governance structures,

			processes and other forums, to the extent possible, to raise issues and obtain needed commitments.
WF-I3	Identifying and planning for workforce requirements is dependent upon Mission Directorates and programs/projects being able to identify with sufficient lead time and in sufficient detail the critical work to be accomplished, and the scope, location, and duration of the work.	Strategies to acquire and/or sustain and develop needed in-house capabilities may not be developed and implemented in time to adequately support program needs. Some work may have to be contracted, leading to erosion of in-house capability.	Agency workforce planning activities must be closely integrated with mission directorates and programs/projects. Planners must work closely with managers to help them accurately articulate workforce requirements that align to mission objectives.
WF-I4	It will be difficult to achieve the appropriate degree of commonality, and corresponding utility and efficiency, for Agency-wide programs and tools – while affording flexibility where possible – based on legacy systems that have been developed and used over the years.	The ability of the Agency to identify and address workforce issues on an Agency-wide basis will be compromised. Efficiencies will be lost because costs to maintain redundant programs, systems, and tools will not be available for use to address other priorities.	Undertake aggressive change management and education activities. Solicit and use buy-in from senior leadership on using common practices and processes. Continue to improve Agency systems, programs and tools, eliminating stovepiped Center approaches, as appropriate. Solicit input from users in development and enhancements. Develop a governance structure to control new program, system, and tool deployments and hold Centers accountable for terminating redundancies.
WF-I5	Unlike the private sector, Federal Agencies are bound by Government-wide statutes and limitations in hiring and managing their workforce.	The Agency may not be able to fully achieve desired outcomes.	During the course of implementation, determine if there are any issues that could appropriately be addressed through legislation.

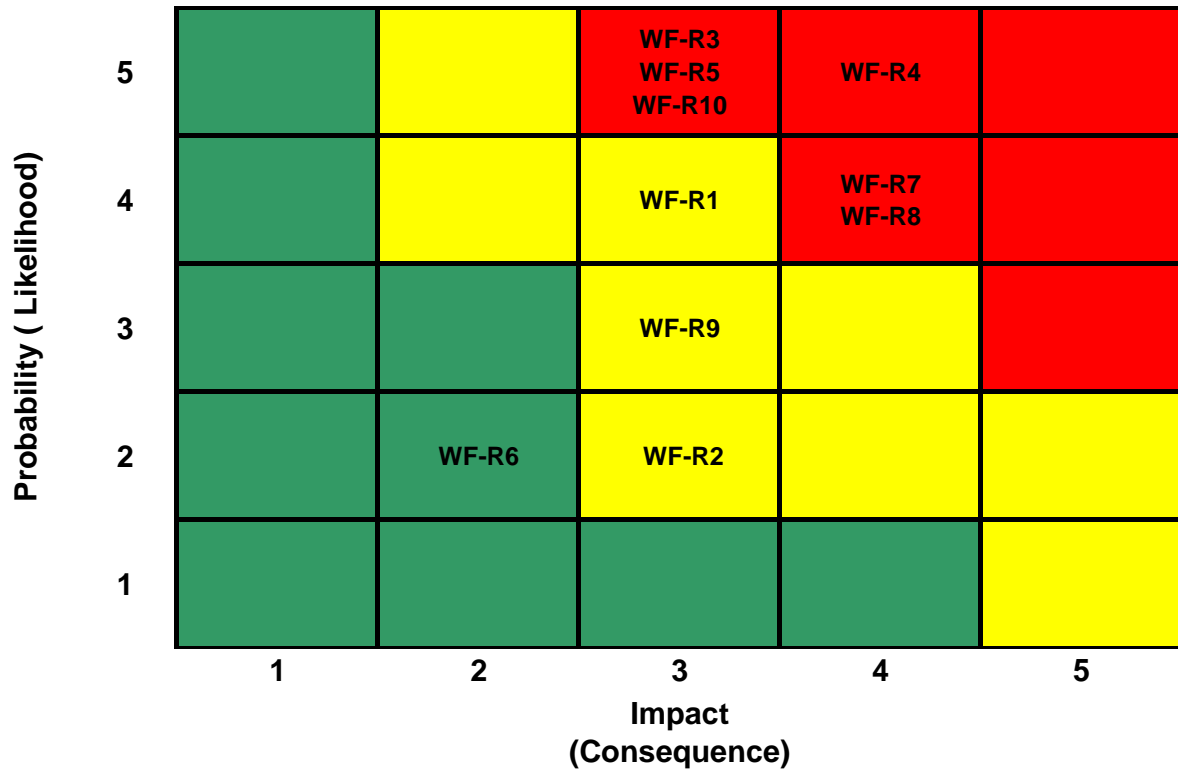
The top ten risks that may prevent the Agency from fully achieving the high-impact Workforce objectives are addressed in the following Risk to Objective Focus Chart and reflected in the Risk Matrix Chart. Mitigation strategies for these risks and issues are being developed and will be included in a future version of this white paper.

Risks to Objectives

Risk #	Concern	Risk Statement	Criticality	Likelihood	Consequence
WF-R1	Lack of early integration between program planning and workforce planning (WF-1A)	Given that program planning and workforce planning processes are not integrated early in the programmatic life cycle, there is a possibility in-house capabilities will not be available when needed by programs/projects or surplus capabilities will exist.	Med	4	3
WF-R2	Capturing accurate workforce data on a timely basis may be difficult for effective workforce planning (WF-1A)	Given that data upon which competency shortages and surpluses are based frequently change, there is the possibility that Agency personnel skill mix will not match needs.	Med	2	3
WF-R3	Analytical capability may not exist in sufficient depth across Agency to do workforce planning (WF-1A)	Given that NASA has not identified what skills are required to conduct effective workforce planning, there is the possibility that the Agency will not have the capability to do needed workforce planning.	High	5	3
WF-R4	Resources may not be available to allow outside hiring to meet mission requirements (WF-2A)	Given that there may be insufficient FTE ceiling/dollars to obtain high quality civil service workforce, there is the possibility the Agency may be unable to fill critical skill needs.	High	5	4
WF-R5	Hiring process lengthy (WF-2A)	Given that the hiring process is cumbersome and lengthy, there is the possibility that the	High	5	3

		Agency may be unable to obtain the best candidates for critical positions in a timely manner.			
WF-R6	Resources may not be available to attract the best talent (WF-2A)	Given that resources are limited, there is the possibility the Agency may be unable to use the flexibilities available to attract the best candidates.	Low	2	2
WF-R7	Lack of clear understanding of core requirements (WF-3A)	Given that we lack a clear understanding of core requirements, there is the possibility that improper skill mix (surplus skills) will result in increased costs.	High	4	4
WF-R8	Programs/projects focus on near-term workforce requirements (WF-3A)	Given that programs tend not to focus on longer-term workforce needs, there is the possibility that sustainable core capability will be compromised.	High	4	4
WF-R9	Inadequate strategy for sustaining core competencies (WF-3A)	Given that workforce planning does not adequately account for sustaining workforce competencies over the long term, there is the possibility that future in-house mission core competencies will not exist.	Med	3	3
WF-R10	Workload demand competes with need for leadership development (WF-3A)	Given that leadership development is not seen as a priority given other workload demands, there is the possibility that the Agency will have poorly trained managers making supervisory and strategic decisions.	High	5	3

RISK ASSESSMENT- WORKFORCE



Criticality	Consequence
High	<ol style="list-style-type: none"> 1 Minimal or no impact 2 Acceptable impact with no change in approach 3 Acceptable impacts with workarounds 4 Unacceptable impact could result in substantial workarounds 5 Major impacts could result in failure.
Med	
Low	

6.2 Focus Area- Infrastructure

Infrastructure Focus Area Owner: Assistant Administrator, Infrastructure and Administration

Point of Contact for Focus Area Document: Diana Hoyt

Overview

Managing of risks to mission success is the overriding focus of the Infrastructure Focus Area Document component of the Mission Support Plan. Infrastructure performance risk and lack of infrastructure capacity, capability, or availability can seriously jeopardize NASA's ability to meet its mission objectives by causing delay or damage to mission in the following ways: cost increases; schedule delays; loss/compromise of mission hardware and/or critical infrastructure assets and/or critical program information/technology; and/or, degraded mission performance. Identifying and mitigating infrastructure risks early in program and project planning, and working in conjunction with program and project managers, increases the likelihood of timely and successful mission accomplishment and provides NASA's missions with a stable, reliable, effective institutional base of support and ensures the health and safety of NASA workforce and the general public.

The goals and objectives of the Infrastructure Focus Area Team are specifically designed to assure that appropriately configured institutional assets and capabilities are available to mission when needed. Meeting these goals and objectives requires continuous communication and the development of collaborative relationships with program customers to understand their requirements and to articulate institutional requirements, resulting in prioritized and optimized mission support Agency-wide. Because the Infrastructure` areas include external requirements and externally-mandated constraints, as well as the use and disposition of government-owned real and personal property, this functional area must be configured and aligned with mission to maximize benefit to the Agency vision and missions, while at the same time assuring NASA compliance with applicable federal, state, and local laws and regulations.

Infrastructure Examples of External Requirements and Mandates

- National Environmental Policy Act (NEPA)
- Occupational Safety and Health Act (OSHA)
- Americans with Disabilities Act (ADA)
- National Historic Preservation Act (NHPA)
- Protection standards from the National Fire Protection Association (NFPA)
- Myriad statutes, laws and regulations governing every aspect of institutional operations, including but not limited to; Executive Orders (EO), Presidential Decision Directives (PDD), and Homeland Security Directives (HSPD) concerning the authorities and responsibilities for security, program protection, and emergency preparedness

Effective execution of the six strategic goals and healthy center attributes identified in the FY2006 NASA Strategic Plan requires a fundamental shift Agency-wide in the way mission support offices engage to support the missions of NASA, moving from a

functional operations-oriented support structure, to a more flexible and adaptable mission support structure. The sub-goals and objectives enumerated below are thus designed to ensure that NASA's base of mission support will adapt to enable new development work and the operational concepts required to implement NASA's vision and future missions, including the Vision for Space Exploration. Fulfillment of the Infrastructure Focus Area Sub-goals and objectives is designed to mitigate current and future infrastructure risks by requiring early joint planning with mission for infrastructure requirements (such as construction or demolition of facilities, aircraft operations and management, facility security, occupational safety, health, and environmental activities to conform with the requirements of NEPA, OSHA, NFPA, environmental remediation activities and the positioning of logistics supply chains) in the life cycle of programs and projects, and by deploying sustainable practices such as materials assurance, Center encroachment management, and facilities condition modeling.

I. Scope

The functional areas included within the scope of this Infrastructure Focus Area Document include Management of Facilities and Real Property, Aircraft, Environment, and Logistics assets and capabilities. In addition to the institutional resources within the scope and control of the Office of Infrastructure and Administration (I&A), there are critical dependencies and points of coordination and collaboration across organizations and functional areas outside the I&A organization, and the Infrastructure goals and objectives account for these key touch points. These key areas include occupational safety and health, critical infrastructure protection, physical security and access control, emergency preparedness, industrial safety, equal opportunity and diversity and information technology. The table to the right of this paragraph outlines some of these crossover points with other programs. Lastly, the

Infrastructure /Program Linkages

INFRASTRUCTURE	LINKED TO	OTHER PROGRAM
Occupational Safety, Health, and Environment	→	Chemical Management
Critical Infrastructure Protection	→	Energy Needs
Physical Security/Access Control	→	Entrance barriers, electronic surveillance tools
Emergency Preparedness	→	In-place shelters
Industrial Safety	→	Noise Attenuation, fire protection
Equal Opportunity	→	Compliance with Americans with Disabilities Act accessibility issues
Information Technology	→	Rooms/buildings to house computers/IT equipment

Infrastructure Focus Area includes the Shared Capability Assets Program (SCAP), an agency-wide activity within the Cross-Agency Support Program budget theme. The

Infrastructure Focus Area goals and objectives are integrated with these functional areas to eliminate potential gaps otherwise caused by organizational “stovepipes.”

II. Sub-goals and Objectives

Requirements- To assure Infrastructure assets and capabilities are available in the timeframe needed by reducing the current and future institutional, programmatic and operational risk to mission through:

1. Effective management of existing infrastructure and institutional systems;
2. Enhanced institutional planning and decision-making; and
3. The proactive deployment of risk mitigation practices and technologies (e.g. materials assurance, sustainable facility design, construction and operations, and Center encroachment reduction).

Sub-goal IN-1: Obtain mission needs by conducting joint planning early and throughout the lifecycle of program and projects.

NASA Program and Project Managers routinely identify and plan early with the Mission Directorates and Centers on the technical requirements for their programs and projects. This process has been developed over time and is clearly spelled out in several NPR's (e.g. 7120.5D). The integration of MSOs or Center Institutional Offices into that early stage planning process does not currently occur, primarily because there is no systematic process or mechanism to encourage this interaction. It is critical that MSOs/Centers obtain mission needs early and throughout the life cycle of the project if they are to effectively support the mission and ensure that necessary infrastructure is in place when it is needed.

Objective IN- 1A: Formalize an infrastructure planning process linked with the Programs, Projects, Budget, and Execution (PPBE) process.

The PPBE Process already links to the Agency Strategic Plan through guidance issued to budget developers, analysis of budget requests, and funding allocation decisions. By incorporating infrastructure planning into that process, Program and Project Managers will be required to consider their infrastructure needs early in and throughout the development cycle, thereby ensuring assets will be appropriate and available when they are needed by mission.

Objective IN-1B: Ensure the formal integration of institutional considerations into programs and projects from project inception to completion and final asset disposition to provide most effective support to mission.

Oftentimes, infrastructure needs change as the project matures. In order to ensure the timeliness and appropriateness of assets to the Programs and Projects, it will be necessary

to incorporate a review of those needs throughout the project life-cycle, and revising as necessary.

Objective IN-1C: Prioritize and allocate infrastructure resources to balance optimal support of mission needs and externally levied requirements.

NASA is committed to comply with external requirements. The key is to find the balance between meeting the externally imposed requirements and achieving NASA's Mission. Therefore, the immediate focus will be to explore ways of complying with the requirements while contributing more directly to mission success. NASA's external requirement strategy includes:

- Applying a filter of mission success/enablement, and careful stewardship of our resources into how we comply with the external requirement;
- Embedding the mission impact evaluation as part of our on-going business process; and
- Proactively evaluate mission impacts with external entities as the requirements are being formulated and developed, and negotiating outcomes that minimize mission impacts before the requirements are finalized

Sub-goal IN-2: Ensure that infrastructure, assets, and capabilities are flexible, aligned, and configured to mission and available when needed.

NASA's aging infrastructure (most facilities are over 40 years old) coupled with designs that were single-use in nature, have resulted in facilities that are obsolete, many that are incapable of retrofitting to accommodate new mission requirements, and assets that are no longer needed. As NASA moves forward with the new Vision for Space Exploration, it is imperative that our infrastructure be realigned to allow for greater flexibility of use, that outdated and unusable assets are outsourced or disposed of, and that our infrastructure assets incorporate a vision for the future that includes multiple uses and options.

Objective IN-2A: Leverage and size assets, capabilities, and resources to meet mission needs, eliminate excess capacity, and scale asset performance accordingly (SCAP).

NASA has acquired assets that are over 40 years old and are obsolete, aging, and present an economic burden to maintain. By "right-sizing" our assets, excess capacity will be eliminated and resources will be allocated where they are needed⁴.

Objective IN-2B: Ensure that institutional systems and infrastructure are resilient, flexible, and adaptable to meet changing mission needs.

⁴ This does not include facilities that are seldom used, but are mission critical when they are needed.

NASA has historically built single use facilities and assets that are incapable of being adapted to different needs than those originally envisioned in the design. NASA's infrastructure must be designed to change as mission needs change, NASA's assets must be built and designed flexible enough to change with them. The economic burden of continuing to design and build for single use, is not consistent with a need for flexibility and resiliency in Agency assets.

Objective IN-2C: Transition shuttle infrastructure assets as appropriate, by developing and implementing disposition plans of unneeded assets to effectively and efficiently support the Vision for Space Exploration.

Much of shuttle facilities and assets are prime examples of designing for single-use. As the shuttles are decommissioned, and their assets and facilities are no longer needed, it is critical that those that are determined to be no longer usable or needed be removed from Agency inventory. It is not cost effective to continue to maintain facilities or assets that are no longer needed.

Objective IN-2D: Develop synergistic partnerships, leasing models and strategic alliances with the private and public sectors; pursue innovative procurement and acquisition strategies; and tailor asset management systems to provide the most effective support to mission

Alternative procurement strategies; whether through partnerships, alliances, or enhanced leasing programs; can free up funding identified for specific projects and allow it to be reallocated to mission.

Sub-goal IN-3: Implement risk mitigation and sustainability practices across the Agency's infrastructure to prevent adverse mission impacts, protect mission resources, and enable the NASA mission to the fullest extent possible.

While risk management has been effectively integrated within the technical areas of NASA, the concept of *infrastructure* risk is only just being explored. These risks to mission include disasters (both natural and human-induced) resulting in loss of critical assets and capabilities, dependence on non-renewable resources, failure to adequately compensate for changing external requirements, and the tendency to view "first-cost" of an asset without considering the "full-cost" of that asset. In order for NASA's infrastructure to adequately support the mission, it is imperative that we begin to plan and develop alternative energy capabilities that are not dependant on wildly fluctuating external demands, look to future needs in master planning and develop systems that are capable of multiple uses with multiple functions.

Objective IN-3A: Integrate continuous risk management practices into the life cycle management of NASA's infrastructure to enhance mission support and sustainability.

Infrastructure risks are still being identified and analyzed. In keeping with the Agency's overall approach to risk management, these risks will be formally documented, assessed, and then managed. This process will help ensure that infrastructure assets will be available to mission when needed.

Objective IN- 3B: Enhance mission performance and reduce life cycle costs of operations, maintenance, and disposition of infrastructure assets to ensure maximum funding is available to mission programs and projects through sustainability design practices and the implementation of new technologies.

As resources become more scarce or expensive to procure, the need for alternative methods for obtaining those mission critical needs will become more pressing. While NASA does not currently have a fully mature sustainable design practice, the development of such a practice is in keeping with NASA's mission to develop new and innovative answers to pressing issues both here on Earth and in outer space.

Objective IN-3C: Reduce the cost of energy and increase resiliency of energy supplies for facilities and transportation operations through the use of alternative energy technology and capabilities.

The cost of energy currently fluctuates wildly, making it difficult to determine exact needs and, although it has yet to become a scarce commodity, most of NASA's energy needs come from non-renewable energy sources. In order to ensure a consistent and steady energy supply, as well as reduce the overall costs of Agency energy needs, NASA must invest in alternative technologies.

Objective IN-3D: Ensure that infrastructure management systems are sustainable and able to meet evolving mission and institutional needs.

The internal management controls and systems within NASA, must be as flexible and as resilient as our other assets to meet the challenges of changing and evolving missions. Internal systems must be able to adapt to whatever mission needs arise, and be capable of changing to meet those needs.

Objective IN-3E: Deploy and maintain risk practices which focus on sustainability.

The inability of the Agency to supply necessary assets such as energy and critical materials needed by missions is a serious risk facing the Agency. Only by focusing on long-term sustainable solutions to these problems can these issues truly be resolved.

Objective IN-3F: Inject formal continuous risk management analysis into master planning and functional reviews to identify and mitigate institutional, programmatic and operational risks.

As mentioned earlier, there is no formal process currently in place to identify infrastructure risks. For example, by utilizing the existing systems of master planning and

functional reviews, some of those risks will be identified. In addition, a process can be developed to integrate infrastructure risk identification into the reviews.

High-Impact Objectives

In a three-day Mission Support Plan (MSP) workshop attended by 75 Center, Headquarters, and Focus Area representatives, participants were asked to prioritize all Focus Area objectives by assessing the Agency consequence of not achieving each objective in the following four areas:

1. Impact on Resources
2. Impact on Management Effectiveness/Efficiencies
3. External Implications
4. Future Sustainability of the Mission

In addition to this evaluation, all participants were asked to cast votes on the objectives they viewed as most critical to the Agency. As a result of these exercises, 24 of all Focus Area objectives were categorized as high priority and six of those 24 are Infrastructure Focus Area objectives. They are:

Objective IN-1B: Ensure the formal integration of institutional considerations into programs and projects from project inception to completion and final asset disposition to provide most effective support to mission.

Objective IN-1C: Prioritize and allocate infrastructure resources to balance optimal support of mission needs and externally levied requirements.

Objective IN-2A: Leverage and size assets, capabilities, and resources to meet mission needs, eliminate excess capacity, and scale asset performance accordingly (SCAP).

Objective IN-2C: Transition shuttle infrastructure assets as appropriate, by developing and implementing disposition plans of unneeded assets to effectively and efficiently support the Vision for Space Exploration

Objective IN-3A: Integrate continuous risk management practices into the life cycle management of NASA's infrastructure to enhance mission support and sustainability.

Objective IN-3B: Enhance mission performance and reduce life cycle costs of operations, maintenance, and disposition of infrastructure assets to ensure maximum funding is available to mission programs and projects through sustainability design practices and the implementation of new technologies

While accomplishment of all of the IN-FOCUS AREA sub-goals and objectives are important and necessary steps to improving the Agency's infrastructure, the objectives

listed above were considered by a cross-agency team to have the highest negative consequence to the Agency if not achieved, and therefore were determined to be the most critical objectives to pursue in the short-term.

III. Performance and Accountability

Sub-Goal IN-1: Obtain mission needs by conducting joint planning early and throughout the lifecycle of program and projects.

Outcome:

Joint planning results in early identification of mission needs and plans for infrastructure and assets such that mission risks are minimized, externally and internally levied requirements are effectively addressed, and mission performance is enhanced.

Metric:

Participation in Phase A and all successive life cycle phases as defined by 7120.5D.

Sub-goal IN-2: Ensure that infrastructure, assets, and capabilities are flexible, aligned, and configured to mission and available when needed.

Outcome:

Changing mission needs are met by infrastructure, assets, and capabilities that are available, capable and flexible.

Metric:

Timely and effective infrastructure asset availability to mission

Sub-goal IN-3: Implement risk mitigation and sustainability practices across the Agency's infrastructure to prevent adverse mission impacts, protect mission resources, and enable the NASA mission to the fullest extent possible.

Outcome:

Future infrastructure risks to mission are mitigated through proactive deployment of sustainability practices.

Metric:

Level of infrastructure risk

IV. Issues and Risks

The following issues/problems are currently impacting the Agency's ability to fully achieve the high impact objectives defined in this Focus Area Document.

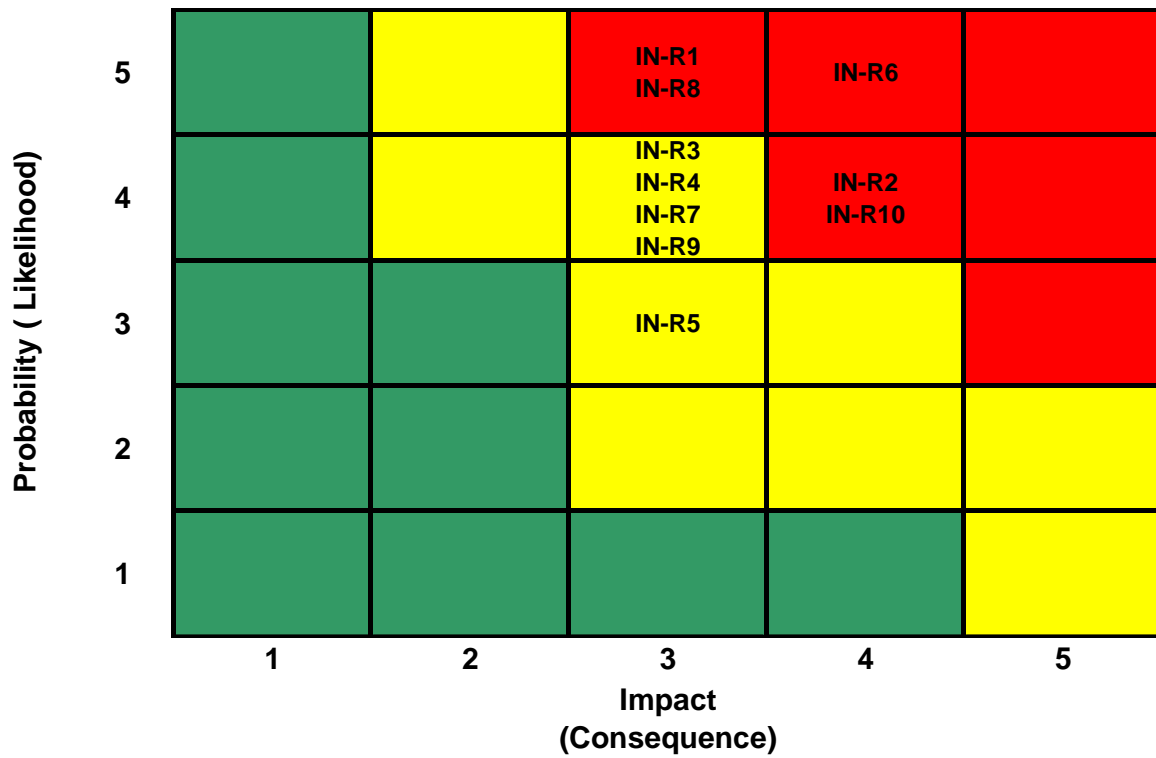
Issue #	Issue/Problem Statement	Impact to Focus Area Document	Remediation Approach
IN-I1	No formal process for obtaining requirements, plans, and needs for mission so that institutional considerations may be integrated.	Lack of effective and integrated process puts minimal risk by increasing the potential for institution-selected cost and schedule problems.	Develop and execute an integration process to insert institutional considerations into current program/project approval and execution processes. Use existing governance mechanisms, structures, and policies wherever possible
IN-I2	No formal methodology for prioritizing institutional requirements across the agency. No common understanding of definition for balancing priorities between mission and external requirements.	Lack of disciplined process leads to ad-hoc, inconsistent and ineffective decisions making.	Implement a portfolio approach to realigning the Agency's institutional base and balancing mission needs with external requirements.
IN-I3	No incentive for disinvestment of excess infrastructure at the level of execution.	Lack of incentive at the level of infrastructure owner (normally centers) hinders NASA's ability to achieve disinvestment goals.	Develop possible incentives and propose to Senior Management.
IN-I4	No formal process for integrating continuous risk management into life cycle of NASA's infrastructure.	Lack of methodical integration of continuous risk management into life cycle can impact cost and schedules.	Develop a formal process for integrating continuous risk management and propose to Senior Management.
IN-I5	Programs and Projects do not design for operations; short term focus instead of long-term focus.	Short-term focus increases the costs escalation in the operations phase.	Raise with Senior Management ideal solution is to require programs/projects to design for operations.

The following risks may prevent the Agency from fully achieving the goals, objectives and outcomes defined in this Focus Area Document. Mitigation strategies for these risks are being developed and will be included in a future version of this Focus Area Document.

Risk #	Concern	Risk Statement	Criticality	Likelihood	Consequence
IN-R1	There is no formal process for obtaining requirements, plans, and needs for mission so that institutional considerations may be integrated.	Given that we have a lack of discipline there is a possibility that ad hoc planning will result in the misuse of resources.	High	5	3
IN-R2	There is no formal process for obtaining requirements, plans, and needs for mission so that institutional considerations may be integrated.	Given that the missions do not fully develop their requirements there is a possibility of not having infrastructure in place to support the mission.	High	4	4
IN-R3	There is no formal process for obtaining requirements, plans, and needs for mission so that institutional considerations may be integrated.	Given that the culture in the Agency is stovepiped, there is a possibility that the planning will not be integrated and remain parochial.	Medium	4	3
IN-R4	There is no formal methodology for prioritizing institutional requirements. No common understanding of how to balance priorities between mission and external requirements.	Given that NASA has three competing missions (making it difficult to determine which is a priority), there is a possibility that right-sizing decisions will be based on only one of the missions and will sub-optimize performance on the others.	Medium	4	3
IN-R6	There is no incentive for disinvestment of excess infrastructure at the level of execution	Given that there is currently no transition budget, there is a possibility that the agency cannot maintain the required assets and capabilities for the mission.	High	5	4

Risk #	Concern	Risk Statement	Criticality	Likelihood	Consequence
IN-R7	There is no formal process for integrating continuous risk management into life cycle of NASA's infrastructure.	Given lack of familiarity of continuous risk management within NASA, there is a possibility that timely and effective implementation may not be achieved	Medium	4	3
IN-R8	There is no formal process for integrating continuous risk management into life cycle of NASA's infrastructure.	Given continuous risk management protocols are not in place, there is a possibility that risk management may not be effectively implemented	High	5	3
IN-R9	There is no formal process for obtaining training or resources needed to implement sustainable practices.	Given that there is a lack of training and resources to support knowledgeable use of new technology, there is a possibility that the Agency could fail to implement sustainable practices.	Medium	4	3
IN-R10	Programs and Projects do not design for operations; short term focus instead of long-term focus.	Given that current budget process focuses on initial costs, there is a possibility that higher cost of operations and maintenance could be diverted from other uses.	High	4	4

RISK ASSESSMENT- INFRASTRUCTURE



Criticality	Consequence
High	1 Minimal or no impact
Med	2 Acceptable impact with no change in approach
Low	3 Acceptable impacts with workarounds
	4 Unacceptable impact could result in substantial workarounds
	5 Major impacts could result in failure.

6.3 Focus Area– Finance

Finance Focus Area Owner:

Point of Contact for Finance Focus Area Document: Pam Cucarola

Overview

NASA's financial position and health play a vital role in the Agency's Mission and its ability to realize the Vision for Space Exploration. The Agency's financial position and health are defined by its ability to present budgets that effectively represent NASA's goals and program requirements, achieve goals within budget and schedule parameters, control operating costs, and account for the financial resources it uses. The American public's ongoing commitment and support of NASA's Mission is essential to its success and depends upon our ability to deliver timely, accurate, and credible financial and performance information that clearly demonstrate how NASA has used its resources. Internally, program and project managers must have accurate, reliable, and timely data for decision-making. Costs and efficiencies must be proactively managed through analyses that yield improvements.

The Finance IPT, through this Focus Area Document, will guide NASA in improving the management of its financial resources, establishing goals and objectives for providing relevant financial information, sharing financial knowledge, and providing financial expertise to NASA's management and scientific communities. The Focus Area Document calls for the Agency to continue to invest in its people, ensuring that they have the skills and knowledge required to provide leadership in areas critical to NASA's Vision: cost estimation and analysis, budgeting, financial analysis, and reporting.

I. Focus Area Scope

The functional areas within the scope of the Finance Integrated Product Team include the Office of the Chief Financial Officer (including Center finance and resources offices), Program Analysis and Evaluation (PA&E), the IEM Program Office, the Office of Infrastructure and Administration (I&A) including Procurement, Facilities, Real Property, Aircraft, Environmental, Logistics, and Corporate Headquarters management.

In addition, there are important cross-organizational functional areas that contribute to Finance Focus Area goals and objectives. These functional areas or offices include the Office of the Chief Engineer and the Office of the Chief Information Officer (support of IT Infrastructure as a component of facilities management).

The Finance Integrated Product Team (FIPT) functional areas described below are an integration of the various responsibilities associated with ensuring the Agency's

financial health. These functions represent multiple processes, activities, and systems whose alignment is necessary to continuously improve NASA's financial management, and ensure that the Agency has the information and analyses to support effective decision-making and resource optimization. Financial integrity impacts all aspects of NASA operations and achieving it will require action from Centers, Missions, programs, projects, and Mission Support Offices.

- a. Accounting: Control, execute, account for, and report on all Agency financial resources. Ensure Agency compliance with Chief Financial Officers Act, Government Performance and Results Act, Government Management Reform Act, Federal Financial Management Improvement Act, Economy Act, Federal Managers Financial Integrity Act; and Office of Management and Budget and Department of Treasury policies and guidance.
- b. Budgeting: Agency programmatic policy formulation, budget formulation, justification, and execution, including analysis, performance measurement and reporting activities. Leads the development and production of all resources related plans and reports, including Strategic Planning Guidance (SPG), Program Decision Memorandums (PDM), the Integrated Budget and Performance Document (IBPD), Operating and Phasing Plans, and the Performance and Accountability Report (PAR).
- c. Strategic Analyses: Portfolio, institutional and Directorate program performance assessments on the basis of cost, schedule, risk and commitments. Conduct external environmental analyses to align NASA's investment posture with technical capabilities in industry. Establish Agency-level goals for cost/efficiency performance improvements.
- d. Cost Estimating: Independent cost estimating and analysis of Agency projects in formulation (and in implementation when warranted by significant project changes or problems during implementation).

II. Goals and Objectives

Financial sub-goals and objectives were developed to support Agency-level financial management requirements. Defined as part of the overall Mission Support Integration Plan (MSIP), these requirements link to the overall MSIP goals, objectives, and requirements, and were provided to the Finance Focus Area as a foundation for its planning.

The requirements are:

1. **Budget Stability and Alignment:** The funds are available to the Agency to finance the missions and resource allocation is properly aligned with Agency strategic direction.
2. **Finance Effectiveness:** Managers are accountable for effective resource use and conservation, including implementation of cost savings measures and full leveraging of budgets and resources.
3. **Financial Management System Effectiveness:** Policies, practices, procedures and tools assure that accurate financial data, information, and records are available in a timely manner for effective decision-making.

In support of these requirements, the Finance Focus Area goals and objectives ensure that the Agency will continue to improve its overall financial management system. That system will facilitate long-term financial planning, translate that planning into sound resource and budget decisions, and improve program and institutional performance through monitoring and performance measurement, disciplined cost management, and improved decision-making supported by accurate, reliable, and timely financial data.

The following sub-goals, objectives, performance measures, and risk mitigation strategies were developed to improve existing financial management system components and fill any that are missing.

Sub-Goal FI-1: Ensure effective financial planning to meet the Agency's long-term mission requirements.

With the NASA Authorization Act of 2005, Congress affirmed the Vision for Space Exploration and the course that President Bush set for us to advance our Nation's economic, scientific, and security interests as core components of NASA's Mission. The Vision for Space Exploration establishes a bold new framework and challenge for the Agency's future, outlining a "building block" strategy that will enable us to explore scientifically valuable destinations across the solar system in a "sustainable, affordable, and flexible manner."

Given the highly complex nature of NASA's work and the uncertainty surrounding research and development projects, especially those related to robotic and human spaceflight, the Agency may not be able to control all variables impacting its path forward. The Agency can, however, plan for success and mitigate potential negative impacts through disciplined strategic planning that includes financial resource planning as a core component.

Objective FI-1A: Implement a process for assessing long-term financial resource needs, relative to Agency long-term mission plans.

The Agency will develop a long-term financial planning process fully aligned with the existing strategic planning process. The process will integrate all financial resource variables, institutional, programmatic, and human capital, to develop a holistic understanding of the financial resource requirements related to achieving the Mission. To address the inherent uncertainties of space exploration and research, cost estimating and scenario planning techniques will be employed. These techniques will consider a range of future possibilities and outcomes that, reflected in long-term financial resource projections, help to improve their fidelity.

Objective FI-1B: Assess and manage the risks to Mission arising from inherent uncertainty of projected long-term financial requirements.

The long-term financial planning process will likely illuminate multiple financial risks to the Mission. In keeping with the Agency's overall approach to risk management, these risks will be formally documented, assessed and managed. This process will help to ensure the availability of financial resources required to sustain the Mission over the long-term.

Sub-Goal FI-2: Align financial resources to the Agency's strategy.

The alignment of financial resources to plans builds a link between the Agency's long-term (10+ year) planning, its mid-term (2 – 10 year) plans and securing the funds to for the near term (1-4 years). It is one of the clearest and most visible expressions of both the Agency's commitment to its mission, and the fundamentals – how funds will be used – intended to achieve those plans. It demonstrates to the President, the Congress and the public the Agency's direction and priorities. The quality and clarity of that alignment provides the basis for explanation and defense of the Agency's budget requests.

The Agency's Planning, Programming, Budget and Execution (PPBE) process strengthens the alignment between the Agency's mission strategy and the financial resources required to support it. The Agency will continue to improve the implementation of the PPBE process, clearly linking programmatic strategy to budget components, and translating the results into a budget request that provides a clear, comprehensive picture of how the Agency intends to use those resources to execute its strategy. To further align resources and strategy, the Agency intends to improve its funds distribution process, simultaneously accelerating access to funds while strengthening the controls that ensure resources are distributed in keeping with Agency commitments.

Objective FI-2A: Align Agency planning and budgeting requests to clearly and comprehensively support Mission requirements.

The PPBE process is the Agency's primary mechanism for aligning the budget with the Agency's strategic plan. This is accomplished, in the PPBE process, through the issuance of strategic guidance to budget developers, analysis of the resulting budget requests, and through "trade-off" decisions made in the allocation of funding to programs/projects. NASA will continue to improve the integration of programs and projects and their alignment with the Agency's mission. Improved fidelity of NASA's 2 to 5 year planning and programming estimates will help programs and projects to project and stabilize their technical and related funding requirements. This, in turn, will improve the ability of the Agency's institutional management to forecast infrastructure requirements. Stability and clarity in direction (planning) and decision-making (budgeting) are critical components for building an integrated Agency perspective on what is required financially to support Mission requirements.

Objective FI-2B: Execute Agency funding decisions in a manner consistent with approved Agency mission and institutional plan.

Once funding decisions are solidified through the Agency's budget and Operating/Execution/Phasing Plans, the execution of those decisions becomes a balance between planned activity and changes that have emerged since budgets were defined. The Agency will evaluate changes, as they impact Mission requirements, and determine appropriate steps to keep Agency funding consistent, to the extent possible, with emerging needs. Analysis of Agency spending will help to determine the effectiveness of both the distribution of funds to programs,

projects, and institutions (speed and accuracy of the distribution of funds) and the use of those funds by those parties to achieve mission goals.

Objective FI-2C: Balance optimal support of mission and institutional needs with externally levied requirements on the financial management system.

NASA develops plans and related budgets to achieve its Mission requirements. Other requirements which consume financial resources are also levied on the Agency by external organizations, such as OMB and Congress. These requirements must be balanced so that, to the extent possible, NASA can accomplish them without major financial impact to any of its core programs.

As Government Accountability Office (GAO), independent financial, and agency internal audits yield recommendations for improving the systems and processes that deliver financial data, the Agency will implement these recommendations in an appropriate and timely manner. Prioritization of recommendations and timelines for implementation will be determined foremost by any impact to Mission. Once priorities are established, the organizations most impacted will reach a common understanding of audit recommendations and will agree upon a common integrated approach for addressing them.

Sub-Goal FI-3: Maximize funding for the Mission.

The Agency must optimize its financial resources, in order to maximize the financial resources allocated to direct Mission program and project activities. In support of this sub-goal, the Agency will assess whether Agency financial resources are appropriately employed to support program technical goals as planned, and determine if adjustments are required. The Agency will also implement cost management programs aimed at improving operating efficiencies and redirecting resources, as appropriate. Lastly, the Agency will ensure internal controls contribute to process efficiency and safeguard resource use.

Objective FI-3A: Evaluate Agency budget and spending in terms of mission performance to gauge whether expected results are being achieved and to focus improvement efforts.

The Agency will regularly monitor program, project and institutional spending to ensure that financial resources are consumed according to plan and in a manner that contributes to the accomplishment of Agency goals and objectives. Spending plans will be adjusted where necessary to account for emerging needs, changes to project approach or schedules, and changes to Agency priorities.

Objective FI-3B: Implement Agency cost management programs to improve Mission and Mission Support operating efficiency and optimize funds available to the Mission.

Agency cost management programs will be developed to optimize funds available to the Mission. These programs will emphasize conservation and sustainable processes wherever possible. The intention of these programs is to support long-term mission viability by deploying

financial processes, techniques and/or innovations that meet today's requirements without compromising the ability to meet future needs.

Objective FI-3C: Embed effective internal controls in all Agency financial management processes and practices.

Internal controls provide an important mechanism for achieving and sustaining effective financial management practices. Built into our processes, these controls will help ensure that work is accomplished consistent with effective financial management principles. Throughout, the Agency will examine the balance between process control and process efficiency.

Sub-Goal FI-4: Provide reliable, accurate, and timely financial resource information for decision-making purposes.

The American public's ongoing commitment and support of NASA's Mission depends largely on the Agency's ability to wisely employ its resources and to demonstrate the same. Both the ability to wisely use resources and to demonstrate such use, require timely, accurate, and reliable data.

The effectiveness of the Agency's program, project and institutional managers is also largely reliant upon the financial information they are provided. NASA's unique relationships with its contractors make the ability to track and project costs a critical competency of its project managers. Additionally, high quality information related to budgets and spending becomes even more important as the Agency adopts the principles and practices of Earned Value Management.

Objective FI-4A: Standardize Agency financial management processes and procedures.

Standardization helps ensure data accuracy, reliability and timeliness. It fosters a common understanding of the data, and it provides for the application of common Agency definitions of financial resource concepts. Each of these elements must be in place to make effective use of financial resource information at an Agency level. While Center-unique differences will be considered in developing and implementing standard process and procedures, the Agency will continue to emphasize and promote the standardization of financial language, policies, processes and reporting.

Objective FI-4B: Provide effective financial and resources management information systems and reporting tools.

The Agency will build management information systems and reporting tools that enable efficient access to, and robust analysis of, financial resources information. In developing these systems and reporting tools, externally mandated systems and reporting requirements will be balanced with Agency's mission requirements to ensure that external requirements are not fulfilled at the expense of the Agency Mission.

Objective FI-4C: Integrate financial information systems, processes, and data with other Agency (HR, Procurement, etc.) information systems, processes, and data.

Currently, Agency data is largely compartmentalized and made available along functional lines. This makes it difficult for Agency decision-makers to make decisions with a full understanding of their impact on all variables affecting performance. Additionally, systems, processes, and data compartmentalization contributes to redundant and misaligned processes, ultimately affecting Agency operating efficiency. Integrating systems and process will facilitate improved decision making and operating efficiency.

High Priority Objectives

In a three-day Mission Support Integration Planning (MSIP) workshop attended by 75 Center, Headquarters, and Focus Area representatives, participants were asked to prioritize all Focus Area objectives by assessing the Agency consequence of not achieving each objective in the following four areas:

5. Impact on Resources
6. Impact on Management Effectiveness/Efficiencies
7. External Implications
8. Future Sustainability of the Mission

In addition to this evaluation, all participants were asked to cast votes on the objectives they viewed as most critical to the Agency. As a result of these exercises, 24 of all Focus Area objectives were categorized as high priority and six of those 24 are Focus Area objectives. They are:

- FI-1A: Implement a process for assessing long-term financial resource needs, relative to Agency long-term mission plans.
- FI-2A: Align Agency planning and budget requests to clearly and comprehensively support mission requirements.
- FI-2B: Execute Agency funding decisions in a manner consistent with approved Agency mission and institutional plans.
- FI-3C: Embed effective internal controls in all Agency financial management processes and practices.
- FI-4B: Provide effective financial and resource management information systems and reporting tools.
- FI-4C: Integrate financial information systems, processes, and data with other Agency (HR, Procurement, etc.) information systems, processes, and data.

While accomplishment of all of the Focus Area sub-goals and objectives are important and necessary steps to improving the Agency's financial management system, the objectives listed above were considered by a cross-agency team to have the highest negative consequence to the Agency if not achieved, and therefore were determined to be the most critical objectives to pursue in the short-term.

Performance and Accountability

Working jointly to meet these sub-goals and objectives, the Agency expects to achieve the following outcomes:

1. NASA produces accurate and timely financial information (FI-2.1, FI-4.1)
 - a. Known data integrity issues impacting confidence in financial data resolved by Q1 FY 2007
 - b. Deliver greater visibility into actual versus estimated program and project cost by Q1 FY 2007
2. By Q2 FY2007, NASA establishes and begins ongoing monitoring of performance against budget plans and funds distribution alignment with those plans. (FI-2.2)
3. By Q1 FY 2008, NASA establishes, and begins on-going monitoring, of key financial and cost indicators and targets. (FI-3.1)
4. By Q1 FY 2010, NASA established cost management targets and associated baselines. (FI-3.2)
5. By Q1 FY 2009, NASA has a baseline of the cost of program performance for all programs. (FI-3.3)
6. By Q1 FY 2009, NASA receives an unqualified audit opinion on its annual financial statements. (FI-4.2)
7. By Q3 FY 2009, NASA receives the Association of Government Accountants' Certificate of Excellence in Accountability Reporting (CEAR) Award for quality and clarity of its Performance Accountability Report. (FI-4.3)
8. By Q1 FY 2010, NASA achieves improved financial management as measured by a green rating on the President's Management Agenda for Financial Management Improvement. (FI-4.4)

III. Issues and Risks

The following issues or problems are currently impacting the Agency's ability to fully achieve the goals, objectives and outcomes defined in this Focus Area Document.

- a. Issue: Building and maintaining Agency-wide support for budgetary, financial management and efficiency improvements. (FI-I1)
- b. Issue: Integrating and aligning budgetary and financial management processes across Procurement, PA&E, Institutions and Management, Chief Engineer's Office, and OCFO. Financial management improvements require that budgetary and financial management processes (from strategic planning to cost estimating to budgeting to procurement to asset management to financial analyses and reporting) be integrated in order to improve the Agency's overall financial position. (FI-I2)
- c. Issue: Preparing robust programmatic and institutional budget analyses given current skills and staffing level. (FI-I3)

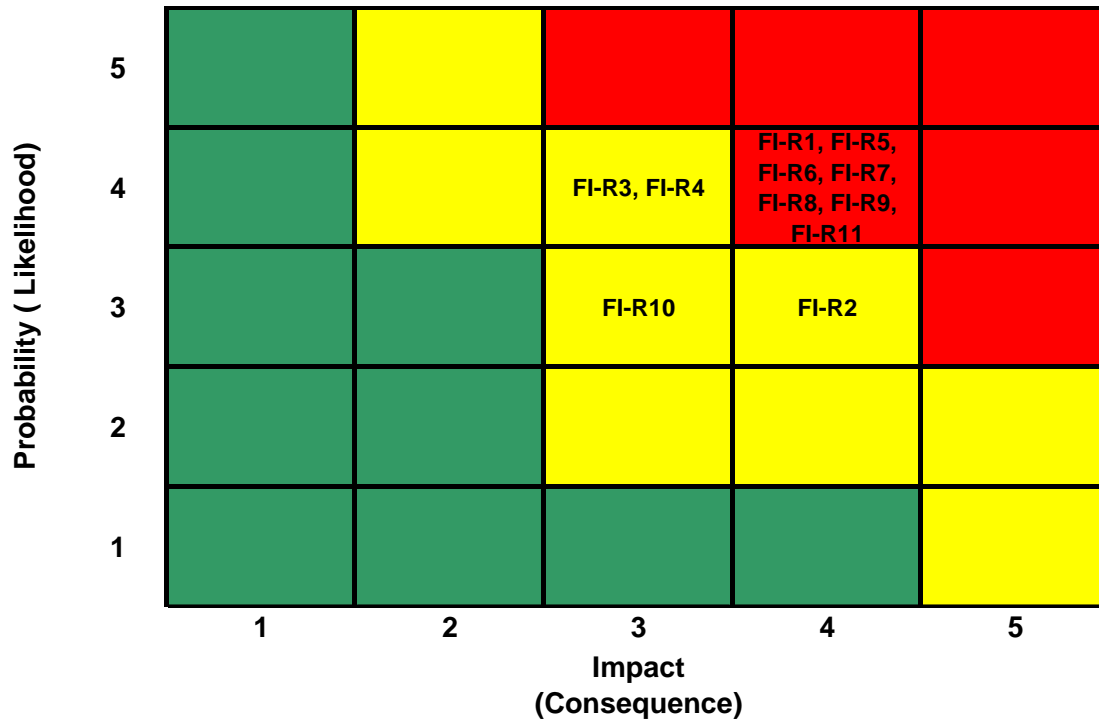
The following risks may prevent the Agency from fully achieving the goals, objectives and outcomes defined in this Focus Area Document. Mitigation strategies for these risks are being developed and will be included in a future version of this Focus Area Document.

Risk #	Concern	Risk Statement	Criticality	Likelihood	Consequence
FI-R1	Impact of scientific and technology uncertainty (FI-1A)	Given the uncertain nature of NASA's work and multiple unknown programmatic variables, there is a possibility that long-term financial planning cannot be conducted with a high degree of confidence in the output	High	4	4
FI-R2	Reliability of cost-estimates incorporated in long-term financial planning (FI-1A)	Given that the Agency is still improving its cost estimating capability, there is a possibility that cost estimates used as a data source for long-term financial planning are not reliable, impacting the quality of long-term financial	Moderate	3	4

Risk #	Concern	Risk Statement	Criticality	Likelihood	Consequence
		planning			
FI-R3	Inability to build long-term Agency support for long-term financial planning (FI-1A)	Given that political volatility often impacts Agency direction, there is a possibility that participants in the long-term planning process perceive it to be a waste of time, impairing commitment to the effort	Moderate	4	3
FI-R4	Unforeseen / Unfunded Federal Mandates (FI-2A)	Given the high and growing number of federal mandates, there is a possibility that Agency funds will be diverted from the Mission, causing program sub optimization or delays	Moderate	4	3
FI-R5	Ineffective and inefficient internal controls implementation (FI-3C)	Given that there is not adequate cross-functional integration with respect to internal controls implementation, there is a possibility that improvements to internal controls will be inefficiently and ineffectively implemented	High	4	4
FI-R6	Internal controls implemented but ineffective (FI-3C)	Given that the Agency does not fully understand internal controls, there is a possibility that the internal controls implemented won't be effective	High	4	4
FI-R7	Inability to implement effective financial resource management	Given that NASA HQs has failed to enforce standards and requirements for specific tools and approaches, there is a possibility that	High	4	4

Risk #	Concern	Risk Statement	Criticality	Likelihood	Consequence
	systems and tools (FI-4B)	inconsistencies in approaches may result in increased cost and schedule slippages when implementing new systems and tools			
FI-R8	Inability to implement effective financial resource management systems and tools (FI-4B)	Given that Centers and Mission Directorates highly value independence and autonomy there is a possibility they will continue to develop organization-unique tools for common functions, increasing costs and decreasing effectiveness of Agency-level financial systems and tools	High	4	4
FI-R9	Inability to integrate finance systems, processes, and data with other functionally compartmentalized systems, processes, and data (FI-4C)	Given that functions do not always share a common definition of key terms or concepts, there is a possibility that the lack of a common definition will impede cross-functional integration	High	4	4
FI-R10	Inability to implement effective financial resource management systems and tools (FI-4B)	Given that centralized, standard automated tools do not exist for some processes or functions, there is a risk that centers will develop their own unique tools, making it more difficult to standardize and centralize over time	High	3	4
FI-R11	Inability to smoothly transition accounting functions to NSSC	Given that accounting processes are being transitioned to the NSSC, there is a possibility that existing internal controls weaknesses will also be transitioned, resulting in processing issues	Moderate	4	4

RISK ASSESSMENT- FINANCE



Criticality	Consequence
High	1 Minimal or no impact
Med	2 Acceptable impact with no change in approach
Low	3 Acceptable impacts with workarounds
	4 Unacceptable impact could result in substantial workarounds
	5. Major impacts could result in failure.

6.4 Focus Area – Information Systems

Information Systems Focus Area Owner: NASA Chief Information Officer

Point of Contact for Focus Area Document: Gary Cox

Overview

The strategic management of information and information technologies will be imperative to realizing the Vision for Space Exploration. Effectively managing, preserving, protecting, and disseminating the information required in achieving and resulting from exploration is vital to mission success. Therefore, NASA will plan, design, implement and manage programmatic and institutional information systems and services that enable NASA's mission and institutional objectives, and in doing so, will meet the Agency's internal and external information needs, conforming to the most appropriate and feasible standards of security and information management, with the fewest number of systems possible.

To achieve the objectives for the strategic management of information and information technology as defined in the 2006 NASA Strategic Plan, NASA will:

- Evaluate the Agency's information solution and service needs required for mission success against the current state by using the NASA Enterprise Architecture, identify any gaps, and formulate concepts and opportunities to fill the gaps;
- Apply best practices and portfolio management in the selection of initiatives and projects for information solutions and services that best meet NASA's priorities within resource constraints;
- Ensure cost, schedule, and performance success of initiatives and projects for information solutions and services by applying Agency policies and best practices for program and project management; and
- Protect the confidentiality, integrity, and availability of information and information systems based on the categorization of the information processed by, or stored within, NASA's information systems.

The entire NASA organization plays a role in ensuring that information assets are acquired, managed and utilized consistent with Federal policies, procedures, and legislation, and that the Agency's \$2.2 billion annual expenditures and investments in mission and institutional information systems are in alignment with NASA's Vision, Mission, and Strategic Goals. Moving forward, NASA must ensure that information system investments are made within an Agency-wide context of priorities, with mission alignment, and in a secure and cross-Center interoperable environment. These investments must bring NASA closer to our desired Agency architecture (one that is more easily defended, more cost-effective, and more service-oriented), rather than optimized at a project or Center level at the expense of overall Agency efficiency. The NASA Enterprise Architecture and supporting policies and procedures are critical for moving the Agency from its current state to the identified target architecture.

I. Focus Area Scope

In some form or fashion, information systems are utilized by nearly all NASA employees and contractors in the conduct of NASA's "business." Therefore, the sub-goals and objectives identified herein affect the entire Agency. The scope of this Focus Area Document encompasses the full spectrum of general purpose information systems and services across the Agency. The Agency classifies information systems under three portfolios, 1) Office Automation Information Technology (OAIT), 2) Multi-Program/Project (MP), and 3) Program Unique (PU). The scope of this Focus Area is the OAIT portfolio.

OAIT includes information systems that provide general purpose computing (e.g., e-mail and calendaring, desktops, help desk services, business applications, etc.) for both civil servants and contractor personnel, regardless of the program or project supported, or fund source. There are three service areas and nine portfolio elements within the OAIT portfolio.

Service Area	Portfolio Element
Communications	Wide Area Network
	Local Area Network
	Voice Communications
	Video Communications
Electronic Work Environment	Desktop Hardware and Software
	Messaging and Collaboration
Computing	Data Centers
	Public Web
	Applications

Embedded within the scope of the Information Systems Focus Area Document and the above portfolio elements are:

- The operational elements of providing enabling information systems and services to end users in a cost effective manner;
- Investments in new initiatives to reduce costs, improve Agency operations and productivity, and otherwise enable the NASA mission, while ensuring those investments are prioritized, controlled and managed to meet cost, schedule and performance commitments; and
- Ensuring the appropriate confidentiality, integrity, and availability of the information and systems through risk-based IT security controls, privacy protection policy, and sound records management practices.

Sub-goals and objectives of this Focus Area Document were derived from multiple interactions with the Division Heads in the Office of the CIO, the NASA Mission Directorate and Center Chief Information Officers (CIOs), the Office of Management and Budget, the Government Accountability Office, the Integrated Enterprise Management Program (IEMP) Manager, Director of the IEMP Competency Center, NASA Integrated Services Network (NISN), and the Office of Security and Program Protection (OSPP). It is anticipated that goals, objectives, and budgets of multiple NASA organizations will map to the sub-goals and objectives herein, including the Office of the CIO (OCIO), OSPP, Office of Space Communications, IEMP, NASA Shared Services Center, Office of Human Capital Management, Office of Procurement, and all NASA Centers.

II. Sub-goals and Objectives

The Focus Area sub-goals and objectives that follow focus on three distinct areas of information systems: 1) Optimization of Operational Systems: systems in steady-state operations and the extent to which they are cost-effective and meeting NASA requirements; 2) Capital Planning and Investment Control: priority-based investments in information systems for development, modernization, enhancement (DME) to provide new capability, improve existing capability, and/or reduce overall costs to the Agency through efficiencies or reduced life-cycle costs; and 3) IT Security: ensuring the confidentiality, integrity and availability of NASA's information and systems throughout its lifecycle.

Optimization of Operational Systems: NASA currently reports to the Office of Management and Budget (OMB) investments of over \$2.2 billion annually on information technology for general purpose and mission purposes. Approximately one-third of this amount is allocated for general purpose information technologies, or roughly \$700 million. Of this amount, 82 percent (\$574 million) is spent on information systems currently in steady-state operation. Many of these systems have been operational for many years and are now considered legacy systems. It is incumbent upon the Agency to evaluate these investments on a regular basis to ensure they are still required, are aligned with current operational and information requirements, and to assess opportunities for consolidation or other improvements to reduce operating costs. Even a 5 percent reduction due to efficiencies amounts to over \$25 million in potential savings annually for the Agency. Therefore, sub-goal IS-1 addresses the need to ensure operational systems meet NASA requirements in an optimal manner, as follows:

Sub-Goal IS-1: Ensure operational information systems and services meet NASA mission and institutional requirements in the optimal manner, considering and balancing resource constraints, external requirements, and mission priorities.

Objective IS-1A: Provide information and information technology solutions across NASA's portfolio elements that meet NASA's requirements in an optimal manner (centrally-managed/centrally-provided, centrally-managed/locally-provide, and/or locally-managed/locally-provided)

Objective IS-1B: Conduct periodic operational analyses to validate performance and mission alignment, and to identify opportunities for cost savings and performance improvements.

Objective IS-1C: Conduct joint planning with mission entities on current information system and services performance and future requirements.

Capital Planning and Investment Control: Approximately 18 percent of the general purpose information technology budget (\$126 million) is allocated to new investments to improve existing capabilities, reduce costs, or meet external requirements. When making these new investments, it is critical that they are prioritized according to Agency need and mission alignment, and that selected investments are controlled utilizing appropriate project management discipline to ensure success. It is imperative that complete and valid requirements are generated and traced to solution alternatives, and that there is appropriate confidence in, and subsequent execution within, the project baseline. The news media reports regularly on information technology projects that wasted millions of taxpayer dollars because appropriate project management discipline was not followed. NASA must ensure that each and every selected project for information systems is a success (completed on time and within budget, meeting customer requirements). Sub-goal IS-2 does not specify “what” new investments in information systems will be undertaken. Instead, IS-2 defines a Focus Area for ensuring that the right investments are prioritized and selected based on alignment with a planned NASA Enterprise Architecture and information requirements, and are managed in a manner that ensures success, as follows:

Sub-Goal IS-2: Ensure new investments in IT systems and services are appropriately selected, controlled and evaluated based on Agency priorities and requirements.

Objective IS-2A: Develop and maintain the NASA Enterprise Architecture to document the current and target architecture for the Agency.

Objective IS-2B: Identify information and services gaps and overlaps, and develop/execute plans to ensure NASA has the proper information for decision-making, and proper services to conduct mission and institutional activities.

Objective IS-2C: Prioritize and select investments based on gap analyses, approved business cases and enterprise architecture reviews, balancing the optimal support of mission needs with externally levied requirements.

Objective IS-2D: Implement IT project investments, ensuring the use of NASA project management discipline and best practices, including independent reviews, to control project cost, schedule, performance and risk.

IT Security: One of the most critical aspects of owning and managing information systems revolves around the concept of ensuring the information is available and accessible when needed (even well into the future as is the case for many NASA missions), can be relied upon as accurate (vitally important for financial and scientific data sets), and is only disseminated to

those people authorized to view it (critical in the case of “sensitive but unclassified” information). In a nutshell, these are the goals of IT security and everyone at NASA has a role in ensuring the confidentiality, integrity and availability of NASA’s information.

There are five critical aspects that NASA must address immediately, as follows:

- Compliance with IT Security Laws and Regulations: Objective IS-3A is to ensure Federal Information Security Management Act (FISMA) requirements are incorporated throughout the lifecycle of information systems. This approach integrates security requirements and controls early in the information system planning and development process, rather than as a costly addition later, once the system has been deployed. Beyond compliance, implementing and testing the effectiveness of the appropriate security controls in information systems as required by FISMA implements a risk-based approach to reducing or accepting risk to Agency information and systems.
- Homeland Security Presidential Directive 12 (HSPD-12): Issued on August 27, 2004 as the Policy for a Common Identification Standard for Federal Employees and Contractors, HSPD-12 requires the issuance of “smart cards” to all Agency employees and contractors, and the use of the smart cards to control physical and logical access to facilities and information systems. The issue is complex and requires an integrated, yet cost-effective, infrastructure to be successful. Objective IS-3B provides the overarching basis for ensuring NASA mitigates the impacts and costs associated with managing identity, authorization, and access to information systems. The value will be in reduced password management effort and improved security of information systems.
- Proactive Protection of Information and Information Systems: Threats and vulnerabilities to information systems are ever-changing and attackers are becoming increasingly more sophisticated in their methods. Objective IS-3C focuses on the continual assessment of information system vulnerabilities and employing appropriate tactics to harden systems against attack.
- Protection of Privacy Information: NASA has a fiduciary responsibility to protect the privacy information of employees and contractors within our systems. Identity theft is a growing concern nationally and internationally. As well, various laws require NASA to ensure the privacy of information about employees, contractors and the public (within our systems) is appropriately protected from disclosure and misuse. Objective IS-3D will provide focus on measures to protect personally identifiable information, such as training, encryption, use of identifiers besides social security numbers, etc.
- Information Management, Availability and Accessibility: Much of NASA’s mission is about the information collected from programmatic activities. Information is the chief deliverable in many cases. A precursor to knowledge management is the requirement for information management, availability and accessibility to ensure information collected today can be found and effectively utilized by the appropriate personnel, including those with disabilities, well into the future. Objective IS-3E captures the concept of information management across multiple domains and ensuring its organization, usefulness, availability, and accessibility moving forward.

Therefore, Sub-Goal IS-3 comprises the domain of activities associated with confidentiality, integrity and availability of NASA’s information assets, as follows:

Sub-Goal IS-3: Ensure the confidentiality, integrity, and availability of NASA information and information systems based on the categorization of the information processed by, or stored within, the systems.

Objective IS-3A: Ensure information technology security is incorporated throughout the information system life-cycle.

Objective IS-3B: Reduce vulnerabilities and costs associated with managing identity, authorization, and access to NASA information systems

Objective IS-3C: Appropriately harden the NASA information infrastructure and systems against compromise of confidentiality, integrity and availability

Objective IS-3D: Ensure the appropriate protection and use of personally identifiable (i.e. Privacy) information.

Objective IS-3E: Manage NASA's information to enable appropriate dissemination and availability (public information, Scientific and Technical Information, program information, etc), and as a foundation for knowledge management.

High-Impact Objectives

During the Mission Support Implementation Planning Risk Workshop conducted November 7-9, 2006, representatives from various NASA organizations were allowed an opportunity to prioritize the sub-goals and objectives for the Information Systems Focus Area, and were asked to assess the consequences to the Agency of not meeting the objectives in the following four areas:

9. Impact on Resources
10. Impact on Management Effectiveness/Efficiencies
11. External Implications
12. Future Sustainability of the Mission

During this exercise, the following 5 objectives of the Information Systems Focus Area were identified by the overall group as priorities for the Agency:

1. Objective IS-1A: Provide information and information technology solutions across NASA's portfolio elements that meet NASA's requirements in an optimal manner (centrally-managed/centrally-provided, centrally-managed/locally-provide, and/or locally-managed/locally-provided).
2. Objective IS-1C: Conduct joint planning with mission entities on current information system and services performance and future requirements.

3. Objective IS-2B: Identify information and services gaps and overlaps, and develop/execute plans to ensure NASA has the proper information for decision-making and proper services to conduct mission and institutional activities.

4. Objective IS-2C: Prioritize and select investments based on gap analyses, approved business cases and enterprise architecture reviews, balancing the optimal support of mission needs with externally levied requirements.

5. Objective IS-3A: Ensure information technology security is incorporated throughout the information system life-cycle.

While accomplishment of all of the Information System Focus Area sub-goals and objectives are important and necessary steps to improving the Agency's information systems, the objectives listed above were considered by a cross-agency team to have the highest negative consequence to the Agency if not achieved, and therefore were determined to be the most critical objectives to pursue in the short-term.

III. Performance And Accountability

Outcome measures for sub-goals of the Information Systems Focus Area are as follows:

Sub-Goal IS-1: Ensure operational information systems and services meet NASA mission and institutional requirements in the optimal manner, considering and balancing resource constraints, external requirements, and mission priorities.

Outcomes:

IS-1.1 NASA information systems and services meet customer requirements

IS-1.2 Core information services are provided in the optimal manner (centrally-managed and centrally-provided, centrally-managed and locally-provided, or locally-managed and locally-provided) from multiple perspectives, including cost, compliance, and customers

Sub-Goal IS-2: Ensure new investments in IT systems and services are appropriately selected, controlled and evaluated based on Agency priorities and requirements.

Outcomes:

IS-2.1 New investments in IT systems are made based on Agency priorities

IS-2.2 Business cases for new investments identify return on investment, mission alignment, risk assessment, and an analysis of alternatives

IS-2.3 Projects to implement new investments in information systems follow NASA procedural requirements for program and project management

Sub-Goal IS-3: Ensure the confidentiality, integrity, and availability of NASA information and information systems based on the categorization of the information processed by, or stored within, the systems.

Outcomes:

IS-3.1 NASA information systems are resilient to attacks from intruders and also meet the requirements of the Federal Information Security Management Act (FISMA)

IS-3.2 NASA utilizes “smart-card” technology in a manner that better enables the mission and also meets the milestone requirements of HSPD-12

IS-3.3 Personally identifiable information is not compromised

IS-3.4 NASA information is collected, stored and managed in a manner that enables appropriately robust use, reuse and longevity

IV. Issues And Risks

The following issues or problems are currently impacting the Agency’s ability to fully achieve the goals, objectives and outcomes defined in this Focus Area Document.

IS-I1. Insufficient Center funding levels to support mission and institutional requirements appropriately. Performance levels are usually determined by, or are a result of, the amount of funding available for Centers to provide services. For instance, some Centers are pulling “seats” out of the ODIN contract in an attempt to save money. Whereas ODIN incorporates hardware and software refresh, patch management, asset management, etc. in the “seat” prices, moving seats out of ODIN usually results in systems that are not interoperable, not compliant with operating system configuration benchmarks, vulnerable to intrusion, etc. As well, when organizations pull seats out of ODIN, fixed costs of the program must be spread across and absorbed by a smaller sector, increasing costs to the organizations that remain. Strategically, NASA must decide the appropriate model for providing IT services across the Agency (considering all appropriate factors such as asset management, IT security, cost, customer satisfaction, etc) and then execute that strategy. (IS-1)

IS-I2. Difficulty in achieving seamless collaboration between Centers on some projects. In some cases it is very difficult for cross-Center collaboration to occur due to differing firewall rule sets, trust relationships, and inconsistent LAN architectures. A NASA virtual private network between Centers should be established to better-enable cross-Center and Agency applications and collaboration. (IS-1)

IS-I3. At some Centers, the bandwidth on the Center LAN is not sufficient to support some projects effectively. Centers need to upgrade networks where necessary to meet project requirements. (IS-1)

IS-I4. There are well over 3,000 public facing websites at NASA, many of which are potential holes into NASA's IT infrastructure and also place unnecessary demands on NASA networks. Many of these websites need to be migrated to the NASA portal infrastructure in order to improve IT security, reduce traffic on the NASA WAN and Center LANs, and to reduce system administration and security costs at the local level. (IS-1)

IS-I7. Business cases are not consistently developed for IT systems and prioritized against other proposed projects at the Agency level. This often results in developing a system that is a high priority for a particular organization, but a lower priority than other systems that are more urgently needed, but unfunded. All new major investments (criteria to be defined and decided by NASA governance processes) in institutional IT projects should go before the NASA Operations Management Council (OMC), or a delegated Agency IT Investment Council, for prioritization and selection. (IS-2)

IS-I8. Earned Value Management (EVM) is required by OMB to be used to control all IT projects for development, modernization or enhancement (DME). Agency project management tools and financial systems are needed to effectively meet this requirement. (IS-2)

IS-I9. There are over 600 NASA IT systems that must be certified and accredited in accordance with National Institutes of Standards and Technology criteria by October 1, 2007 in order for NASA to maintain compliance with the Federal Information Security Management Act (FISMA). This is not a trivial effort and will require reallocation of resources at the Center and Program level in order to recover from the current state of noncompliance. Center Directors and Mission Directorate Associate Administrators will need to hold owners of information systems accountable for meeting the October 1, 2007 deadline. The NASA Deputy Administrator will then need to hold Center Directors and Mission Directorate AAs accountable for meeting the requirements. Any system not compliant by October 1, 2007 will either need approval from the Deputy Administrator to operate under an interim authority for 6 months, or be decommissioned until a current Certification and Accreditation is conducted. (IS-3)

IS-I10. Per HSPD-12, NASA must issue smart cards to all employees and contractors by October 27, 2007 and begin using the cards for access to NASA systems. An infrastructure to issue and manage the cards, identity information, IT accounts, and directory services is necessary in order to meet the requirements of HSPD-12 in the most cost-effective manner. A concerted effort among the Program Executive for HSPD-12, Office of the CIO, Office of Security and Program Protection, Office of Human Capital Management, and Office of Procurement, as well as Center counterparts will be vital to the implementation of this capability. (IS-3)

IS-I11. The distributed nature of the information systems architecture and the current IT sourcing strategy of NASA makes it difficult to provide effective "defense in depth" throughout the Agency. This large scale distribution of information systems and management leads to great variation in implementation of patch management, operating system configurations, network monitoring, vulnerability scanning, intrusion detection, firewall configurations, Internet protocol (IP) address management, etc. NASA must develop an organizational framework, governance model, and service provisioning model that will ensure effective defense in depth. (IS-3)

IS-I12. There is limited capability and skill among the Agency to take appropriate measures to protect sensitive but unclassified information, especially personally identifiable information. This places sensitive data at considerable risk. The Agency must develop and implement policies, procedures, tools, and training to ensure this data is properly protected from unauthorized disclosure. (IS-3)

IS-I13. NASA generates and relies upon a great deal of information in the conduct of business for the Agency and the stockpile is ever-expanding. Most of this information is unstructured, making it difficult to find when needed, or to reuse as appropriate, often resulting in the recreation of the information. NASA must develop an information management policy and procedures to address the meta-tagging, collection, storage, and reuse of information before the stockpile becomes too large. (IS-3)

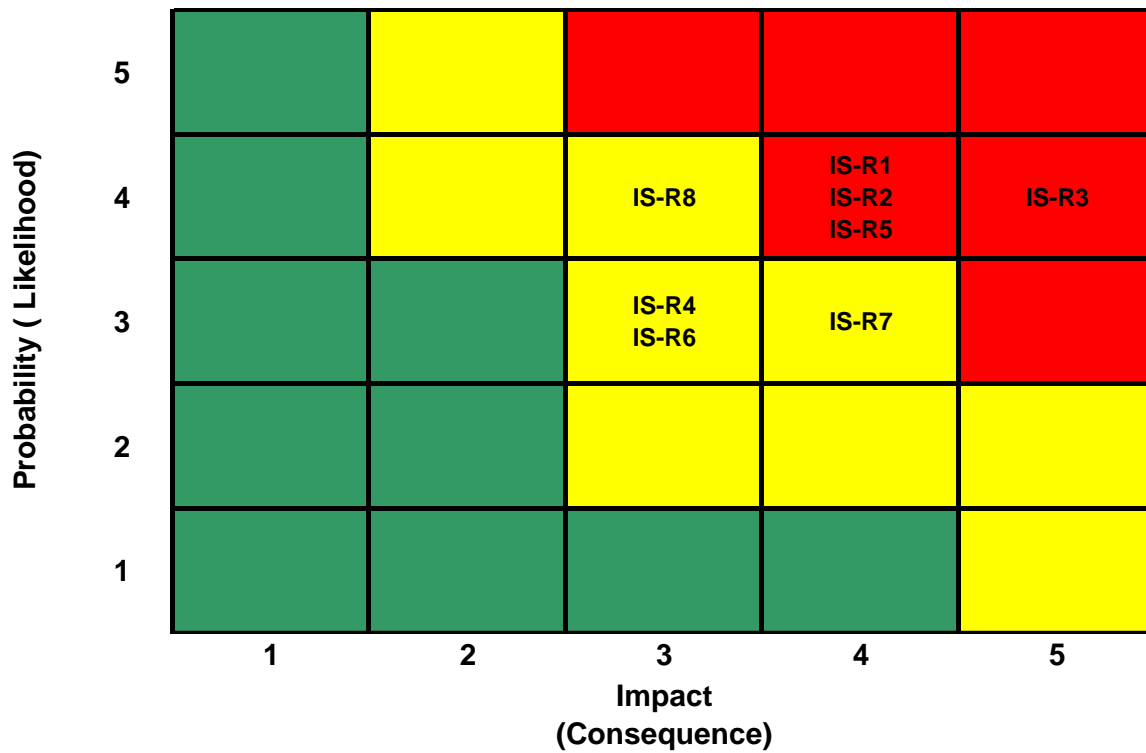
IS-I14. The strategy (see IS-I1) and governance structure for providing and managing information technology and systems at NASA must be validated and decided upon by the NASA Strategic Management Council (SMC), thus allowing the flow down of policy, procedural requirements, organization structures, and sourcing models to be developed for providing and utilizing information systems at NASA in a manner consistent with the information technology infrastructure strategy (IS-1, IS-2, IS-3).

The following risks may prevent the Agency from fully achieving the goals, objectives, and outcomes defined in this Focus Area Document. Mitigation strategies for these risks are being developed and will be included in a future version of this document.

Risk #	Concern	Risk Statement	Criticality	Likelihood	Consequence
IS-R1	Level of Center resources	Given that Centers must spread limited personnel and CMO funding across multiple areas, such as facilities, security, and information systems, there is a possibility that sufficient resources will not be available to meet customer satisfaction levels, FISMA compliance, and HSPD-12 milestones.	High	4	4
IS-R2	Governance over information systems	Given the reliance on an extremely distributed model for providing information services, there is a possibility that the current governance model for information systems may not be appropriate for implementing and managing the objectives identified.	High	4	4
IS-R3	Unforeseen External Mandates	Given the dynamic nature of the federal information technology domain and OMB's role in overseeing E-Government, there is a possibility that Agency information system priorities may change substantially based on external factors, impacting the ability to focus and execute on the prioritized objectives identified herein.	High	4	5
IS-R4	Prioritization and Commitment to Execution	Given the many activities in which the Agency is involved (everyone has too much to do), there is a possibility that many of the objectives may be overcome by other pressing matters at the organization level.	Moderate	3	3
IS-R5	Resistance to Change	Given that implementing many of the objectives will require significant change, there is a possibility that resistance to the	High	4	4

Risk #	Concern	Risk Statement	Criticality	Likelihood	Consequence
		change will hinder implementation.			
IS-R6	Information Technology Workforce Capabilities	Given the increasing complexity in managing information systems, protecting sensitive information, and ensuring compliance with laws and regulations, coupled with Government-wide demand for talented IT workers, there is a possibility the Agency workforce may lack the skills and abilities required to execute the objectives.	Moderate	3	3
IS-R7	Over-reliance on single sources of technologies or services	Given the increased focus on providing core services in a centralized manner, there is a possibility the Agency may become overly reliant on a single technology, vendor or source, making it difficult to change to better alternatives in the future.	Moderate	3	4
IS-R8	Increase in external audits	Given the increased scrutiny of IT by OMB, Congress and the NASA Inspector General, there is a possibility that significant NASA resources will be required to support the audits and inspections, as opposed to meeting IT system operational requirements, such as IT security.	Moderate	4	3

RISK ASSESSMENT- INFORMATION SYSTEMS



Criticality	Consequence
High	1 Minimal or no impact
Med	2 Acceptable impact with no change in approach
Low	3 Acceptable impacts with workarounds
	4 Unacceptable impact could result in substantial workarounds
	5 Major impacts could result in failure.

6.5 Focus Area – Management Systems

Management Systems Focus Area Owner: Associate Administrator for Program Analysis and Evaluation

Point of Contact for Management Systems Focus Area Document: Julie Pollitt

Overview

A management system can be defined as the set of processes, procedures, policies, tools and organizations performing the management functions of the Agency. There are multiple management systems at NASA including (not inclusive) the financial management system, the acquisition management system, the human capital management system, the information management system, the various infrastructure management systems, the program management system and the strategic management and governance system. The main functions of the management systems are to: 1) support decision-making, 2) provide a framework to conduct the operational activities of the Agency and 3) allow management of Agency resources.

The financial management system, easily recognizable by most NASA entities, provides an example of a function-specific management system that focuses decision-making surrounding the financial resources of the Agency. It provides a framework of the financial operations and allows the management of those finances. The latter two systems in the above list, the program management system and the strategic management and governance system, cross multiple functions and are highly dependent on the effectiveness of the various function-specific management systems. All of the management systems must work in concert to deliver on the mission, goals and objectives of NASA.

IV. Focus Area Scope

The work of this Integrated Product Team (IPT) was to conceive what the Agency must do to remove current management systems deficits, improve processes and procedures to best manage the Agency's assets and activities, conduct business in an efficient manner, and facilitate decision-making to assure the most effective implementation of the Agency's missions. The foundation for the Agency to do so is set through accomplishing the sub-goals and objectives and addressing the issues and risks contained in this Focus Area Document.

This Focus Area Document addresses the integration and coordination of these multiple systems in to an effective and efficient "system of management systems". Integration of all of these management systems is key to: 1) reduce a duplication of efforts, hence staff time and dollars, 2) optimize decision-making and 3) identify unknowns that may impact the efficient and timely operations of the Agency. In combination these management systems can: 1) produce decisions that are validated by all relevant parties and in the best interest of the Agency, 2) ensure good management of external and internal requirements to deliver on the mission in the most effective and efficient manner, 3) efficiently deal with systemic (cross-multiple systems) issues 4) ensure the most efficient NASA operations and business, and 5) ascertain the integrated performance toward the strategic directions and missions of NASA.

Further, this Focus Area Document focuses on the activities required to produce a framework for the description, monitoring, control and measurement of the efficiency and effectiveness of all the management systems and their integration. This framework will cross-cut and apply to all the Agency's management systems. It provides a common foundation for assuring that the Agency understands what is being provided by its management systems in support of the NASA mission. The activities to assure the effectiveness and efficiency of some function-specific management systems are dealt with in the other Focus Area Documents within the Mission support plan.

In essence, the scope of this Focus Area Document encompasses the work of every Mission Support Office and their Center-level counterparts, and to date there is not a single organization that encompasses the whole of the "system of management systems". The integrated management system components are currently shared by the Office of Program Analysis and Evaluation (PA&E), the Office of Infrastructure and Administration (I&A) Management Systems Division, the Office of the Chief Engineer (OCE), the Office of the Chief Financial Officer (OCFO), the Office of the Chief Information Officer, Office of Program and Institution Integration (OPII) and the Integrated Enterprise Management Program (IEMP) Office. It is these organizations that will be relied on for the implementation of the sub-goals and objectives, in addition to addressing the issues and risks to achieve them.

V. Goals and Objectives

Management Systems sub-goals and objectives were developed to support Agency-level management system requirements. Defined as part of the overall Mission Support Integration Plan (MSP), these requirements link to the overall MSP goals, objectives, and requirements, and were provided to the Management Systems Focus Area as a foundation for its planning.

The requirements are:

- 1) **Strategic Management and Governance Effectiveness:** the strategic management and governance system(s) elements are in place and operating effectively to produce decisions on current and future directions, monitor the progress toward this direction and provide course corrections due to underperforming or over-performing areas. Strategic management and governance activities produce the framework that guides the products of the management systems.
- 2) **Operations/Business Process Execution Effectiveness and Efficiency:** the management system(s) in place and effectively communicating and operating in an integrated manner to streamline the operations/business activities of the Agency. This is the business of managing the assets and performing key Agency support functions.
- 3) **Internal Management Control:** the policy, process and procedural controls are in place to assure that the management systems products support delivery on the Agency's goals and objectives. Involves:

- a) Management systems are defined with clear boundaries and products so that their processes, policies, tools and organization is understood (provides a foundation for measurement of the effectiveness)
- b) Management systems deficiencies are understood and can be corrected.
- c) Organizational structure that support effective controls and monitoring.
- d) Ongoing evaluations to determine the effectiveness of internal controls, including setting and tracking appropriate system performance metrics.

In support of these requirements, the Management Systems Focus Area (MSFA) sub-goals and objectives ensure that the Agency will be successful at assuring the effectiveness and efficiency of its management systems and the products that they produce. The MSFA sub-goals and objectives for the near-term timeframe focus on setting up the definition of the management systems, their boundaries and intersections, identifying deficiencies and gaps, and setting up the processes and actions to address these deficiencies and gaps. Little focus is placed on addressing deficiencies or gaps in any one system, but several known ones are addressed in the integration of the management systems. As the work is accomplished in the first two sub-goals, the results will add activities and objectives to this Focus Area Document for sub-goal MS-3. Further, the accomplishment of sub-goal MS-1 will assure for the long-term that deficiencies are tracked and dealt with on a continual basis.

Sub-Goal MS-1: Understand the components of the integrated Agency management systems and implementing models to provide a baseline for measuring and improving the current processes, policies, procedures and tools.

The management systems of the Agency are highly complex systems and have many processes, personnel, policies, procedures and tools assigned to them. Each system has multiple internal and external requirements placed on it that shape the system content and definition. Further, each NASA Center may have a variation on each function-specific management system. This was especially apparent as the use of a new tool and processes were introduced for the financial management system several years ago. Due to the complex nature and the variations that may exist across the Agency, there is a lack of clarity on what the current management systems are comprised of, hence difficulty in identifying what gaps and deficiencies exist. Further, there has been no formal effort to look at them in an integrated manner to assess the interdependencies between systems and whether one system is receiving what it requires from another system to continue with its operations.

Objective MS-1A: Produce process and information (data) flow maps of the key discrete management systems.

The foundation to the integrated management system is the individual function-specific management systems. Each function-specific management system has a supporting set of policies, procedures, tools, personnel, data and products that are produced and that may intersect with another function-specific management system and definitely intersects with the strategic management and governance system or the program management system. The Agency will describe and document, i.e. create a model of, the aspects of these individual systems with their

key controls and input requirements from other systems. The description will also include the process elements and data flows through the systems.

Objective MS-1B: Map the baseline, integrated system of management system architecture, including the interdependencies, intersections and combined products.

A mapping of the discrete management systems into a single integrated system of management systems will be baselined to record the key interdependencies and intersections among the systems. This mapping will depict how the combined products of each discrete system support Agency activities such as decision-making and operations. Particular attention will be given to the cross-functional systems, such as the program management system, and their linkages to the various function-specific management systems. An integrated “system of management systems” model is key to provide a basis for determining where data gaps exist within the systems, which process intersections are broken and if duplication of function exists.

Objective MS-1C: Align the NASA Enterprise Architecture to the integrated and individual management systems models, to facilitate the alignment of the IT investments with the needs of the management systems.

The NASA Enterprise Architecture provides a model of the business aspects of NASA and is used to assure strategic information technology decisions are made. The information management system delivers the information used within the management systems. It is key to align the information needs of the various Agency management systems with strategic investment decisions. Therefore, the Enterprise Architecture must be aligned with the “system of management systems” and the individual management system models.

The following mission support offices will be key to the achievement of this sub-goal and its objectives:

- **I&A/Management Systems Division:** Identify the common terms and standards used to describe the systems and for the system models. Work in conjunction with the functional-management-system owners to provide a definition and boundaries for the various systems.
- **IEMP:** production of process and data maps, basis of the models, of the various management systems,
- **OCIO:** support to IEMP and linkage of the models of the various management systems. Assurance that the generated data maps are accurate and the identified gaps are accounted for into the information needs of the Agency through the Enterprise Architecture.
- **Various Mission Support Office Functional-System and Integrated System Owners:** Work in conjunction with the Management Systems Division to provide a definition and boundaries for the various systems. For example, PA&E, OPII, OCFO and the OCE will provide the definition of the strategic management and governance system. As another example, the OCFO will provide the definition of the financial management system.

Sub-Goal MS-2: Ensure that an effective internal management controls system is developed and implemented.

An effective internal management controls system provides reasonable assurance that federally mandated requirements and NASA-specific control objectives are met. It provides for on-going monitoring of each management system and the integrated management systems, which is key to continually assess the effectiveness and efficiency of each. As the management systems are modeled, control procedures and metrics will be identified to monitor and measure the performance of each system. Further, to assure success in application of the controls a specific organizational structure will be required to continually prioritize where the Agency will focus in addressing the deficiencies of the management systems.

Objective MS-2A: Identify gaps and deficiencies between processes, policies, procedures and tools in, and/or barriers to success in fulfilling the purpose of the integrated system of management systems, and individual management system models.

Once the set of management systems and their integration is defined, the current management system architecture will be assessed against a model of what is needed for the Agency. The difference between the baseline management system and what is needed will provide information on the gaps and deficiencies that exist and must be addressed. Further, reviews by various entities of NASA's management systems will be factored into what the Agency will address in the processes, policies, procedures, organizational structure and tools within each management system.

Objective MS-2B: Develop appropriate controls and performance metrics for processes effectiveness and efficiency.

Each of these systems and their integration must produce their products in support of the Agency's mission, the series of controls and metrics that are placed on them will allow NASA to assure that this is occurring. The objective of each management system, as well as the integrated management system, is critical for determining the appropriate controls and metrics. The correct controls and metrics applied to the processes, procedures and data flows through the management systems will be key to ascertain their effectiveness and assure efficiencies.

Objective MS-2C: Institute a continuous monitoring and reporting set of organizations, processes and procedures to track progress toward removing gaps and deficiencies, and ensuring the effectiveness and efficiency of the management systems.

Subsequent to identifying the deficiencies and gaps within the management systems, internal management control and system performance must periodically be monitored to ensure effective attention and continual emphasis on corrective action tracking and improving the control environment. Currently discussions are occurring as to what the correct organizational structure and rules of engagement will be to assure the continual monitoring of the internal management controls. This organizational structure must include:

- Ownership and management of the baseline management system(s) models,
- Configuration control of the leveraged requirements on the management system(s) and their integrated products,
- Ability for tracking and monitoring key management system performance metrics,
- Oversight on the development of appropriate controls, and
- Assessment of progress toward the removal of gaps and deficiencies.

The following mission support offices will be key to the achievement of this sub-goal and its objectives:

- **I&A/Management Systems Division:** Ownership and management of the Agency baseline models both current and planned for the integrated system of management systems. Definition and then management of internal control process. Oversight on the effectiveness of the Agency's internal controls. Support to management systems owners in identifying deficiencies and gaps.
- **PA&E/OPII:** Analytical support to I&A/MSD in identification of gaps and deficiencies in the integrated system of management systems.
- **Various Mission Support Office Functional-System and Integrated System Owners:** Work in conjunction with the Management Systems Division to identify their individual management system gaps and deficiencies. Development of appropriate controls and metrics to determine the effectiveness of their various systems.

Sub-Goal MS-3: Remove known existing deficiencies in the NASA management systems, including integration deficiencies.

There are several key deficiencies that exist in the current set of management systems that touch many of these systems. The deficiencies focus primarily on the integration across these systems. These are addressed in the objectives below. As the Agency produces valid system models and identifies gaps and deficiencies in the baseline systems, these objectives will be expanded and further defined.

Objective MS-3A: Improve the processes and tools used for integration and coordination between determining NASA strategy, developing performance objectives and resource planning and allocation among all organizations and across the various management systems.

This objective is to assure the effectiveness of the Planning, Programming, Budgeting and Execution System. This is an objective that is also key and hence highlighted in the Focus Area Document that addresses the financial management system. There are several issues that must be resolved within this system:

- There is no recognized, complete, integrated and agreed to set of Agency-level performance management processes that integrate the planning, monitoring and reporting of strategic, programmatic and institutional performance,
- Integrated implementation planning does not exist between programs and institution, and

- There is an incomplete set of processes, policies and tools that assure the alignment of all resources (funding, workforce, real property, information assets, etc) to mission.

Objective MS-3B: Develop the required policy and process to assure a continuous mission support planning and reassessment of alignment to and integration with mission.

As highlighted in the narrative for the above objective there is an incomplete and ad-hoc set of processes, procedure, policy and tools to assure the alignment of all Agency resources to the mission. Specifically, an approach needs to be developed for on-going alignment of mission support functions to Agency mission. This process and procedures are to be documented in the Mission support planning NASA Procedural Requirements and NASA Policy Document.

Objective MS-3C: Initiate a process to manage the external requirements leveraged on the Agency, including classification, prioritization among and control of the various requirements, to assure the requirements are implemented in the most cost-effective and mission-aligned manner possible.

The collective set of policy, legislation and regulations provide a framework, both definition and constraints, within which each of the management systems functions. Often this set of requirements may set up conflicts between various management systems. Sometimes, these requirements are costly to implement, conflict with achievement of the NASA mission and remove activities that are effective and efficient. A level of management and control is required to deal with these requirements and assure the best balance of meeting the requirements and the achievement of the mission.

The following mission support offices will be key to the achievement of this sub-goal and its objectives:

- **PA&E:** Correction of deficiencies within the PPBE system. Linkage of mission support and mission planning activities to the process including workforce, infrastructure and acquisition planning. Assures the integration of all planning.
- **OCFO:** Correction of deficiencies within the PPBE system.
- **OPII:** Assurance of the integration of all planning.
- **OCE:** Assurance of the integration of all planning.
- **I&A/Management Systems Division:** Oversight that the gaps and deficiencies in the various management systems are being addressed.

High Impact Objectives

In a three-day Mission Support Integration Planning (MSP) workshop attended by approximately 64 Center, Headquarters, and Focus Area representatives, participants were asked to prioritize all Focus Area objectives by applying the following criteria:

13. Impact on Resources
14. Impact on Management Effectiveness/Efficiencies
15. External Implications

16. Future Sustainability of the Mission

In addition to this evaluation, all participants were asked to cast votes on the objectives they viewed as most critical to the Agency. As a result of these exercises, 24 of all Focus Area objectives were categorized as high priority and three of those 24 are the Management Systems objectives. They are:

- MS-1B: Map the baseline, integrated system of management system architecture, including the interdependencies, intersections and combined products.
- MS-2A: Identify gaps and deficiencies between processes, policies, procedures and tools in, and/or barriers to success in fulfilling the purpose of the integrated system of management systems, and individual management system models.
- MS-2C: Institute a continuous monitoring and reporting set of organizations, processes and procedures to track progress toward removing gaps and deficiencies, and ensuring the effectiveness and efficiency of the management systems.

While accomplishment of all of the MSFA sub-goals and objectives are important and necessary steps to improving the Agency's individual and integrated management system, the objectives listed above were considered by a cross-Agency team to have the highest negative consequence to the Agency if not achieved, and therefore were determined to be the most critical objectives to pursue in the short-term.

VI. Performance and Accountability

Working jointly to meet these sub-goals and objectives, the Agency expects to achieve the following outcomes:

Outcome MS-1

Definition, documentation and Agency-wide communication of the components of the management systems to show their interrelationships, dependencies, and integration points.

Metrics

- A verified and validated flow map of the current function-specific management systems at the Agency level.
- A verified and validated mapping of the current state of interrelationships and interdependencies of those management systems identified.

Outcome MS-2

Risks to mission (from management system deficiencies and gaps) are identified and mitigated through an integrated internal management control program consisting of policies, procedures, and processes, consistent with standards for internal control in the Federal government.

Metrics

- Develop and implement a Management Control Plan that includes the Agency function-specific assessable units and outlines the standards by which each unit is evaluated.

These standards are control environment, risk assessment, control activity, monitoring and communication.

- Select a subset of the Agency assessable units and sample those units against the internal control elements to ensure consistent execution of the plan.

Outcome MS-3

A clearly defined set of management system with processes and procedures that are unambiguous and effective, lines of authority and accountability that are documented and well understood, controls are continuously tested and monitored, resources and assets are effectively and efficiently managed.

Metrics

- Assess the design and effectiveness of the controls to prevent or detect deficiencies within function-specific management systems.
- Regularly monitor the corrective action to closure of known system deficiencies including the identification of root cause, corrective action plans, validations and verifications and closures.
- Test whether on-going monitoring is taking place within the function-specific management systems.

VII. Issues and Risks

The following issues / problems are currently impacting the Agency's ability to fully achieve the high impact objectives defined in this Focus Area Document.

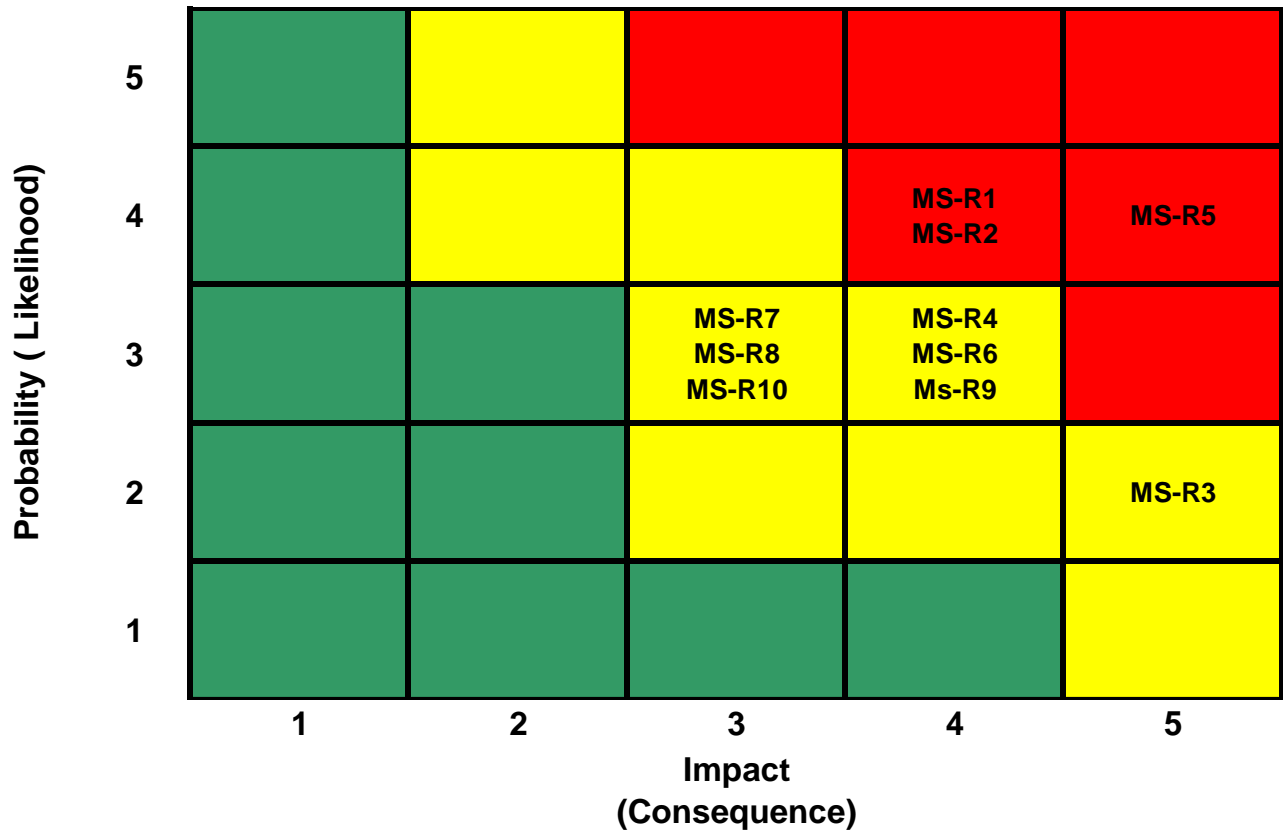
Issue #	Issue/Problem Statement	Impact to Focus Area Document	Remediation Approach
MS-I1	There is no single entity that is responsible for coordinating the work to achieve the sub-goals, objectives and mitigate the risks contained in this Focus Area Document.	Inefficiencies exist with the lack of coordination that lead to duplication of effort and/or incomplete addressing of the objectives and risks.	Identify a single organizational entity to monitor the Agency's work toward the sub-goals and objectives outlined in this Focus Area Document.
MS-I2	In the past little focus has been placed on defining and controlling the NASA management systems, hence there is not a large knowledge and skill base in this arena.	Timing of the objectives and their completion, especially if the knowledge and skill require development from within the Agency,	Contract out discrete tasks in support of the goals and objectives.

The following risks may prevent the Agency from fully achieving the sub-goals, objectives and outcomes defined in this Focus Area Document. Mitigation strategies for these risks are being developed and will be included in a future version of this Focus Area Document.

Risk #	Concern	Risk Statement	Likelihood	Consequence
MS-R1	The system mapping effort is currently not in the Agency's plans to the extent required.	Given that sufficient resources (funding, personnel, etc.) are unavailable to develop the system flow maps, there is a possibility that the Agency will not have the ability to internally identify and then mitigate the risks to mission introduced by the deficiencies and gaps within the management systems. <i>(MS-1B)</i>	4	4
MS-R2	There is a high level of mistrust between NASA organizations and clear stovepipes.	Given that there is lack of cooperation from appropriate organizations to develop the function-specific management systems flow maps, there is a possibility that the information required to produce the maps will be incomplete or unavailable. <i>(MS-1B)</i>	4	4
MS-R3	Lack of in-house knowledge and skills about management systems definition and modeling.	Given that there is incomplete knowledge of function-specific management systems to develop the flow maps, there is a possibility that the Agency will not be successful in producing the required set of maps in the timeframe needed. <i>(MS-1B)</i>	2	5
MS-R4	The management systems of the Agency are not clearly defined or bounded at this time.	Given that there is a lack of understanding of what management systems are and that there is no clear charter for each one, there is a possibility that a mapping of the management systems will be fragmented or incomplete. <i>(MS-1B)</i>	3	4
MS-R5	There is a lack of standardization across the multiple NASA entities involved in any management system.	Given that there is no organization allowed to set and determine standards for management system models including bounding conditions, the various management systems will not be modeled and defined with enough commonality to integrate. <i>(MS-1B, MS-2A)</i>	4	5

Risk #	Concern	Risk Statement	Likelihood	Consequence
MS-R6	NASA organizations are at different levels of readiness/ understanding of what constitutes a management control.	Given that the Agency does not fully understand and may not be ready to incorporate internal controls, there is a possibility that the internal controls implemented won't be effective across all of the systems and some of the most significant gaps and deficiencies will not be addressed. (MS-2A)	3	4
MS-R7	Lack of in-house knowledge and skills about management systems definition and modeling.	Given that a comprehensive gap and deficiency analysis is not conducted, there is a possibility that the Agency will not have the ability to identify and mitigate all risks related to mission introduced by duplication, wasted resources, etc. (MS-2A)	3	3
MS-R8	Sustainability of efforts through management changes	Given that there is lack of support from senior management as a result of a change of that management to conduct on-going system performance monitoring and reporting, there is a possibility that the Agency will not have comprehensive information regarding the management system to make accurate decisions. (MS-2C)	3	3
MS-R9	Sustainability of efforts through management changes	Given that sufficient resources are unavailable to complete the effort, there is a possibility that the Agency will experience degradation to performance resulting in an increased likelihood of Agency material weaknesses. (MS-2C)	3	4
MS-R10	Inability to reach agreement on controls and metrics due to the diversity of needs across and independence of the NASA organizations.	Given the diversity of various organization needs and starting conditions, there is a possibility that consensus on and the integration of appropriate controls and metrics cannot be achieved for each management system and the integration. (MS-2C)	3	3

RISK ASSESSMENT- MANAGEMENT SYSTEMS



Criticality	Consequence
High	1 Minimal or no impact
Med	2 Acceptable impact with no change in approach
Low	3 Acceptable impacts with workarounds
	4 Unacceptable impact could result in substantial workarounds
	5 Major impacts could result in failure.

APPENDICES

APPENDIX A - HISTORY OF THE MSP

The requirement and context for mission support planning and documentation is defined in NASA's Strategic Management and Governance Handbook. The mission planning effort began in February 2006, as a result of a mission support offsite meeting held by the NASA Deputy Administrator. During the offsite meeting, each Headquarters Mission Support Offices and NASA Center presented goals and challenges for their organizations. The following cross-organizational observations were made:

- The VSE will require different skills, facilities, and capabilities than the Agency currently possesses
- Information is needed in a timely, consistent, efficient and secure manner and the Agency currently lacks the "system" (processes, policies and tools) to provide it
- Information/communication flows both internally and externally need improvement
- Aligning resources to strategy is key to success of the VSE and for Agency credibility
- Need an Agency strategy to balance the external requirements with what is in the best interest of the Agency (in achieving its business).

During the forum, cross-cutting themes among the mission support areas emerged. NASA's senior leadership immediately recognized the need for an institutional architecture for the VSE. As a first step, the decision was made to develop an integrated mission support plan, linked explicitly to the Agency Strategic Plan, to ensure those institutional activities required for the VSE are the focus of Agency attention and funding. Activities not required are to be realigned or terminated.

The team agreed that this Mission Support Plan (MSP) would focus on Workforce, Infrastructure, Management Systems (including Information Systems), and Stakeholder Commitment. These Focus Areas naturally developed from synergies and similarities in each of the Mission Support Offices. They also agreed that as a later step, Headquarters MSOs would develop, as needed, management plans in direct support of the MSIP. The Office of Program Analysis and Evaluation (PA&E) and the Office of Infrastructure and Administration (I&A) were given the action to co-sponsor the activities related to completion of the Plan.

A NASA Policy Directive (NPD) for the MSP has been developed and outlines the responsibility and authorities for MSP activities and documentation. A NASA Procedural Requirements (NPR) document has also been developed that outlines MSO alignment with other governance documents, the Mission Support Offices covered under this Plan, and required response to external requirements.

A Core Team comprised of representatives from PA&E, I&A, and the Office of Program and Institutional Integration provided guidance, integration and oversight in the development of the MSP. Initially referred to as Integrated Product Teams (IPTs)- but later changed to Focus Area Teams- were identified for the five functional areas identified above; however, during the development process, the Stakeholder Commitment Focus Areas was suspended pending internal

restructuring, and Information Systems was established as an additional Focus Area separate from Management Systems.

The Core Team developed an Agency-level framework consisting of requirements for mission support (flowing from the Strategic Plan) in each of the functional areas. Agency-level mission support goals (see Section 4.0) were developed by the Core Team and Focus Area Leads. The institutional framework and mission support goals were used by the IPTs to develop White Papers (see Chapter 6) defining measurable sub-goals and objectives. Headquarters MSOs provided input to the Focus Area Documents.

Through a series of exercises conducted during the MSP Risk Management Workshop, held November 7 – 9, 2006, representatives from the Mission Support Offices, Mission Directorates, and Centers placed the IPT objectives into 3 groupings, of approximately equal numbers, designated as “high,” “medium,” and “low” priority based on the consequences to the Agency of not achieving each objective. Consequences were identified on the basis of: Impact on Resources, Management Effectiveness/Efficiency, External Implications, and Future Sustainability. Rankings by the group at large were validated by the attending Focus Areas. In prioritizing the Focus Area objectives, it was recognized that all were significant and merited attention and all will be pursued as laid out in individual MSO management plans to be developed. Within the scope of the each IPT, however, certain objectives stood out.

The outcome of the Mission Support Implementation Plan would not be achieved if the Plan did not tie to resources. The Plan serves as a working document enabling NASA to establish investment priorities as an integral part of the annual planning, programming, budgeting, and execution process.

To determine where alignment gaps occur, MSO organizational goals were being mapped to the IPT sub-goals. The intent was to ensure that the Agency identified and filled critical gaps in order to reduce risk and best support the mission. Also through this process, Agency management could identify mission support activities that don’t align with the mission. These activities will be assessed to see if they can be terminated, realigned or restructured as needed to support the mission and meet external requirements. It should be noted that the Agency may accept misalignments as the cost of doing business. For example, activities needed to meet certain external requirements may drain resources away from the mission but cannot be terminated. Budget realignment will follow and guidance will be provided to MSOs Centers through the planning, programming, budgeting and execution process. Agency management will make decisions about mission support directions and budget based on reducing risk to mission.

Once the process was complete and the Mission Support Plan was becoming finalized, the development team could no longer accurately be referred to as “integrated process teams” and their name changed to Focus Area /Team/Leaders. Similarly, the IPT White Papers were changed to Focus Area Documents to more accurately reflect the documents contents and purpose.

The Mission Support Implementation Plan was also re-named to the Mission Support Plan, again to more accurately reflect the intent and purpose of the document.

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APPENDIX B - DEFINITIONS

Alignment

The positioning of the institutional policies, practices, and strategies in relationship to the agency's strategic plan and performance plan, so that the institutional activity is in direct support of the agency's mission, goals, and objectives.

Annual Performance Goals, Mission Support

A target level of institutional performance at a specified time or period expressed as a tangible, measurable outcome, against which actual achievement can be compared, including a goal expressed as a quantitative standard, value, or rate. A performance goal is comprised of a performance measure with targets and time frames. The distinction between “long-term” and “annual” refers to the relative time frames for achievement of the goals.

Continuous Risk Management

The on-going integration of the management of risks at each level of management activities into a comprehensive, structured and systematic process which balances, through overall risk trade-offs, all aspects of business and strategic planning and decision-making efforts.

Consequence- The impact of a particular action. The scale used throughout this document is as follows:

- 1 Minimal or no impact
- 2 Acceptable impact with no change in approach
- 3 Acceptable impacts with workarounds
- 4 Unacceptable impact could result in substantial workarounds
- 5 Major impacts could result in failure.

Framework

A structured description of a topic of interest, including a detailed statement of the problem(s) to be solved and the goal(s) to be achieved cutting across all Mission Support Areas.

Focus Area Leads

The individuals from each Focus Area that were responsible for coordinating and collaborating with other members of their area in writing and finalizing their Focus Area Document.

Focus Area Owner

The mission support organization covered by a specific Focus Area Document.

Focus Area Team

A grouping of Mission Support staff collectively responsible for delivering a defined product or process. The MSFT is composed of people who plan, execute, and

implement decisions for the system being evaluated. It includes empowered representatives (stakeholders) from each functional area being evaluated.

Goals, Mission Support

A targeted level of accomplishment, in the mission support arena, expressed as a tangible and measurable objective against which actual achievement is compared.

Governance

Refers to how Agency-level decisions are made above the level of line organizations. Governance by council is used only in those cases where the decisions require a high degree of visibility, integration, and approval. Examples include approval of the Agency Strategic Plan or approval for a major project to transition from formulation to implementation. Governance also has a role in the approval and oversight of strategic planning; implementation of the Agency's programs, projects, and activities; and in monitoring and controlling activities for which operational baselines have been established. While governance is not a stage of the strategic management framework, it does provide oversight of the Agency's strategic management.

Infrastructure Requirements.

The real property/facilities, aircraft, personal property/equipment, and information technology resources, that are required to support programs and projects. Utilization of the capability afforded by the infrastructure includes full lifecycle cost, including operations, sustainment, disposal, environmental impacts and other liabilities it presents.

Institutional Base

The human resources, real property, facilities, aircraft, personal property, equipment, information technology resources, and administrative and program support services (e.g., environmental management) required to support programs and projects.

Institutional Risk Management

An organized, systematic decision making process that efficiently identifies, analyzes, plans, tracks, controls, communicates, and documents risk to increase the likelihood of achieving program/project goals.

Likelihood

The degree of certainty of an event occurring or not occurring. The scale utilized in this document is as follows:

5- Very High Likelihood

Qualitative: Nearly certain to occur, requires immediate mgt attention. Controls have little or no effect.

Quantitative: <100%

4- High Likelihood

Qualitative: Highly likely to occur, most cases require mgt attention. Controls have significant uncertainties.

Quantitative: $\leq 50\%$

3- Moderate Likelihood

Qualitative: May occur, mgt required in some cases. Controls exist with some uncertainties.

Quantitative: $\leq 33\%$

2- Low Likelihood

Qualitative: Not likely to occur, mgt not required in all cases. Controls have minor limitations/uncertainties.

Quantitative: $\leq 10\%$

1- Very Low Likelihood

Qualitative: Very unlikely to occur, mgt not required in most cases. Strong Controls in Place.

Quantitative: $\leq 5\%$

Metric

A measurement taken over a period of time that communicates vital information about a process or activity. A metric should drive appropriate action.

Outcome Measures

Outcomes are institutional performance measures of NASA's progress toward achieving longer-term Strategic Objectives and Strategic Goals. Performance on an outcome is determined by weighing the performance of associated Annual Performance Goals against management's timeline for achieving the outcome.

Mission

A major activity required to accomplish an Agency goal or to effectively pursue a scientific, technological, or engineering opportunity directly related to an Agency goal. Mission needs are independent of any particular system or technological solution.

Mission Support Office

Headquarters organizations that establish and disseminate policy and leadership strategies within assigned areas of responsibility in support of all NASA programs and activities.

NASA Strategic Plan

The Strategic Plan documents the agency's long-term goals, articulated in a coherent plan that establishes the framework under which NASA may achieve its vision "to advance U.S. scientific, security, and economic interests through a robust space exploration program."

Objectives

A specific milestone or target level necessary to realize Agency goals.

Performance Measurements, Mission Support

Indicators, statistics, or metrics used to gauge performance across the institutional base.

Planning, Programming, Budgeting and Execution (PPBE) Process

An agency-wide methodology for aligning resources in a comprehensive, disciplined, top-down approach that supports the agency's vision and mission. It focuses on translating strategy into actionable programs and bringing together agency priorities and strategic outcomes within the agency's resource constraints.

Program

A strategic investment by a Mission Directorate or Mission Support Office that has defined goals, objectives, architecture, funding level, and a management structure that supports one or more projects. Additional information on programs may be found in NPR 7120.5D.

Program Plan

The document that establishes the baseline for implementation, signed by the MDAA (or MSOD), Center Director, and Program Manager.

Project

A specific investment identified in a Program Plan having defined goals, objectives, requirements, life-cycle cost, a beginning, and an end.

Risk

The combination of the probability that a program or project will experience an undesired event (some examples include a cost overrun, schedule slippage, safety mishap, health problem, malicious activities, environmental impact, failure to achieve a needed scientific or technological breakthrough or mission success criteria) and the consequences, impact, or severity of the undesired event, were it to occur. Both the probability and consequences may have associated uncertainties.

Risk Management

An organized, systematic decision-making process that efficiently identifies, analyzes, plans, tracks, controls, communicates, and documents risk to increase the likelihood of achieving program/project goals.

Risk Assessment

An evaluation of a risk item that determines (1) what can go wrong, (2) how likely is it to occur, and (3) what the consequences are.

Sustainability

An overarching concept incorporating appropriate sustainable design practices, maintainable design elements, building commissioning processes, and safety and

security features into facility planning, design, construction, activation, operation and maintenance, and decommissioning to enhance and balance facility life cycle cost, environmental impact, and occupant health, safety, security, and productivity. Done properly, sustainability will optimize the facility acquisition process to ensure the "best fit" of the built environment to the natural environment. It requires a practical and balanced approach to responsible stewardship of our natural, human and financial resources.

Sustainability Design

The systems approach to design and construction for facilities, systems, and equipment that insures consideration of the optimization of ecological and human issues in light of well-grounded acceptable economic constraints.